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BIOETHICS SYMPOSIUM  
AUBURN UNIVERSITY, MARCH 30, 2001

Introduction

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Why is a biologist introducing a symposium whose contributors are all philosophers? In fact, what is a symposium on bioethics doing on the program for the Alabama Academy of Science at all rather than, say, a symposium on The Amphibians of Alabama or The Ecology of Chemical Waste Dumps in the Southeast? One answer to both questions is that more and more biologists and other natural scientists are taking an interest in philosophy, and reciprocally, more and more philosophers are closely watching recent developments in biology. Readers of multidisciplinary journals like *Science* or *Nature* and scholars who nurture even occasional interactions with colleagues in the "other culture" are already keenly aware of this. Both of these journals publish weekly essays on science and society, and they also frequently contain pieces on the territories marked by the overlapping of science and art, science and law, or science and ethics. Theologians have not taken such an interest in biology since Darwin's publication of *The Origin of Species*. Sociobiology, cloning, the use of embryonic stem cells, the eugenic potential of gene diagnosis and therapy, and claims that scientific reductionism will lay bare the physical basis for self-reflective human consciousness all mount new challenges to longstanding theological views on what it means to be human. Recent issues of *Zygon*, the journal of the Institute on Religion in an Age of Science, have featured articles by biologists Ursula Goodenough and Edward O. Wilson. Several book titles during the past decade also bear witness to an increased interest in the interface between biology and the humanities:

*Religion in an Age of Science* (Ian Barbour, 1990),  
*Darwin's Dangerous Idea* (Daniel C. Dennett, 1995),  
*Consilience: the unity of knowledge* (Edward O. Wilson, 1998),  
*The Sacred Depths of Nature* (Ursula Goodenough, 1998),  
*Rocks of Ages-Science and Religion in the Fullness of Life* (Stephen J. Gould, 1999),  
*Genes, Genesis and God* (Holmes Rolston, III, 1999),  
*Finding Darwin's God* (Kenneth R. Miller, 1999),  
*Controlling Our Destinies: Historical Philosophical, Ethical, and Theological Perspectives on the Human Genome Project* (Phillip Sloan, ed., 2000).

This fresh flurry of scholarship plus a burgeoning political and public discussion of the issues make the areas of intersection between philosophy and biology very interesting spots indeed. The dynamics of that interface, especially in the health sciences, now interests most of the literate public. Some voices proclaim how longevity and vitality will be increased by

## Introduction to Symposium

research on cloning, embryonic stem cells, and the ends of chromosomes called telomeres. Others warn of the physical and psychological risks of cloning, of the immoral or unethical nature of treating human embryos in the laboratory as though they were frog embryos, and of the deleterious effects that virtual immortality for a few might have on society. Overlying all of this is the recent completion of the Human Genome Project with its potential for enhancing human health and its associated perils for privacy, social justice, and the legal system that have already begun to manifest themselves. Inequalities in the allocation and delivery of health care and health insurance have been major national social and political issues for over a decade. The last presidential campaigns spotlighted them again but with little clarification of which paths to follow for solutions. Eugenics has emerged again as an urgent social issue in the context of genetic engineering and gene therapy and so also has the ethics of experimentation on human subjects. Thoughtful people recognize the value of continuing to bear witness to horrific mistakes of the past such as the atrocities committed in Nazi death camps and events that occurred just 20 miles down the road from here at Tuskegee - all in the name of advancing medical knowledge.

A glance at the symposium presentation titles shows that several Auburn and Tuskegee University scholars are grappling with issues that engage both biology and philosophy. I conclude this introduction by calling attention to an essay titled "The Final Freedom" by Alan Wolfe that appeared in the March 18, 2001, issue of *The New York Times Magazine*. The final freedom is moral freedom. Wolfe argues that the 19th century was about economic freedom, that the 20th century was about political freedom, and that the 21st century will be about Americans deciding for themselves what is moral and what is not, largely without direction from religious doctrine. Making wise bioethical decisions requires information, and attention to the contributions comprising this symposium is a good way to gather some of the requisite information.

In addition to enhancing informed decision-making by all of those hearing or reading the following contributions, I have another hope for this symposium. That is for it to stimulate the formation of a new section within the Alabama Academy of Science wherein scholars at universities across the state can explore the territory conjoining science and the humanities. These explorations may include publishing in the *Journal of the Alabama Academy of Science*, seeking personal interactions and nurturing collaborations at annual meetings, and sharing ideas about how information emerging from the humanities-science interface can be brought before the general public in Alabama and the Southeast.

## JUSTICE AND HEALTH CARE DELIVERY

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G. H. T. Kimball of the Twentieth Century Fund wrote:

"It is bad enough that a man should be ignorant, for this cuts him off from the commerce of men's minds. It is perhaps worse that a man should be poor, for this condemns him to a life of stint and scheming, and there is no time for dreams and no respite for weariness. But what surely is worse is that a man should be unwell, for this prevents his doing anything much about either his poverty or his ignorance."<sup>1</sup>

I want to argue for the right to health care on three grounds: respect for persons and informed consent, justice, and utility. There are more justificatory implements, but time constraints prohibit using them all. Since much of the first argument depends on the outcome of empirical scientific evidence, more time will be spent developing the relevance of empirical claims to justifying the right to health care rather than in amplifying the underlying philosophical principles on the basis of which health care rights might be justified. First, I will state four principles which I intend to assert as needing no specific justification. Like the mathematician and the scientist, the philosopher has to begin with axioms or first principles before any real argument can be constructed. And like the scientist, the philosopher must at least attempt to give some kind of extra-systematic justification for first principles. I hope you will excuse me if I come up somewhat short on the latter during this presentation.

*Principle 1: In a techno-industrial civilization, where the basic processes for manufacturing are trade secrets involving substances which are known to be harmful to individuals and where some may have unknown but harmful health effects, it is unfair and irrational to hold individuals responsible for the health consequences inflicted upon them without their voluntary and fully informed consent.* Whether this principle is arrived at via a Kantian Categorical Imperative that demands the universalization of the precepts whereby we are governed, or that insists that there is respect for the autonomy of people as rational agents, or that individuals be treated always as ends and never merely as means is unimportant. It is a fairly sensible, deontological principle in the sense that many would consider it binding *independently of the social costs required to implement it.* We may

disagree about how the principle is implemented, who bears the costs, how the costs are to be distributed, but most of us would accept it. That I am prepared at least to argue that it entails a "right" to health care means that I anticipate that reasonable people can disagree about implementation as well.

*Principle 2: If we have socially undertaken obligations that guarantee rights to any people in a society, then we have such obligations not to arbitrarily deny other people such rights.* This principle may similarly follow from the Kantian imperatives mentioned above with the addition that while exceptions to a rule may be made, reasoned justifications must be given. This rule simply excludes irrational discrimination, not all discrimination whatsoever. We might call it the principle of non-arbitrary discrimination.

*Principle 3: It there are some rights that are so basic that to deny these rights would be to deny indirectly all rights a person might possess, then it follows that there is what a philosopher (Henry Shue) has called a "basic right," and that would be the right to health care in this case since without it, no individual could enjoy other rights.* This principle may not seem as obvious as the first two and will require much more argument, but the argument may be stated succinctly. If certain basic rights are the avenues to certain "other" rights deemed to be human rights, then if we have the other rights, we must have the avenues to these rights. And we do have some of the other rights.

*Principle 4: Given that diseases strike randomly, that neither race, nor sex, nor class, nor education, nor wealth, nor any other acquired human characteristic (short of a kind of science-fiction genetic engineering ) can guarantee immunity from such randomness, then if society can afford it, everyone should be protected from the random harms caused by the unpredictability of disease states.*

It is possible that one could grant all of the above principles and still not get to the conclusion that universal, nationally funded health care should be available to all. But for now, rather than talk about how to get around the conclusion, I want to see how all roads lead to the conclusion.

Many of you no doubt watched the March 26 airing on PBS stations of the Bill Moyers special program entitled, "Trade Secrets." The show was scheduled to appear shortly after the March 21, 2001 release by the Centers for Disease Control of the study entitled "National Report on Human Exposure to Environmental Chemicals." For this purpose, the CDC used a technique called "biomonitoring," that is, "the assessment of human exposure to chemicals by measuring the chemicals or their metabolites in human specimens, such as blood or urine."<sup>2</sup> Once baselines are established for the population as a whole, abnormal exposure levels can be established when individuals show higher concentrations of such chemicals or their metabolites for purposes of diagnosing the contributory causes of human illnesses in specific cases.

The first edition of this soon-to-be-more-controversial report, records the levels of "27 environmental chemicals measured in the U. S. population including metals (lead, mercury, uranium, for example), cotinine (a marker of secondhand tobacco exposure), organophosphate pesticide metabolites, and phthalate metabolites."<sup>3</sup> The sample included people participating in the 1999 National Health and Nutrition Examination Survey (NHANES 1999). It is worth noting that a number of the environmental chemicals studied

are also included on the list of "Top 20 Hazardous Substances" published by the Agency for Toxic Substances and Disease Registry.

It is also remarkable that Bill Moyers reported being tested himself for chemical exposure. He was tested by another facility at the Mount Sinai School of Medicine for 120 different chemicals and the test results revealed that his body contained "eighty-four distinct chemicals."<sup>4</sup> The results revealed evidence of three major kinds of exposure: Mr. Moyers's body contained hazardous chemicals in common use; chemical compounds banned for more than a quarter century; and other chemicals obscure enough to defy explanation concerning what kind of exposure would have induced them in his body. If Mr. Moyers is typical of the average U. S. citizen and if we may assume that no one would knowingly risk exposure to hazardous substances without good reason, then should adverse health effects be present, it would violate Principle 1 to hold such individuals responsible for these health consequences. Fairly typical of the kinds of trade secrets kept from the public and reported in Mr. Moyers's special program were the brain and liver carcinogenic and hand-injuring effects of vinyl chloride. The point is not that it is complicated for environmental toxicologists to discover the connections between chemical substances and human disease or injury (as it was in, say, Rachel Carsons's day), but that many industries knowing of the human injury that could be caused by products they were producing deliberately withheld this knowledge from the citizens and consumers of this country.

What the program stresses is that the industry's own documents reveal that its representatives knew of the hazards posed by a number of chemicals long before people actually died from exposure to these chemicals. It may take years, lots of scientific research and a sophisticated group of environmental toxicologists working with specialists in biomonitoring to sort out the health effects of the 75,000 chemicals registered with the Environmental Protection agency since only a small number have actually been through complete testing to ascertain their impact on human health. The daunting task and the impossibility of conducting the required scientific research precludes product liability and/or civil and criminal lawsuits for the resolution of disputes over harm resulting from the use of these substances. Therefore, it is arguable at least that some kind of national health insurance program should be in place to cover the medical needs of those stricken by environmentally induced medical illnesses. It will be the job of the scientific communities to push this research forward and not to allow science to be politicized in the process. Certainly the documentation of a reduction by 7.5 per cent in the cotinines associated with secondhand exposure to cigarette smoke as well as a reduction in the amount of lead exposure are positive outcomes of such monitoring.

Principle 2 demands that we extend the right to health care to all citizens. Because age is not a factor which should determine the right to be protected from harms unknowingly accepted as a condition of living in a techno-industrial society, children should be included within the scope of a right to health care. And because race is not a rational basis for exclusion from the right to health care, African-Americans should also enjoy such a right. Too often the special susceptibilities of children to environmental toxicities is underappreciated, and this is mentioned in the PBS report. Children get "heftier doses of pollutants because of their small sizes"; because their "faster metabolisms...speed up their absorption of contaminants"; because they "live closer to the ground, where the highest

concentration of many air pollutants settle"; because they put more things in their mouths; and because they don't store contaminants "in the same ways that adults do."<sup>5</sup>

The irrational denial of health care access to African-Americans should be subject to a related kind of scrutiny. The existence of a two-tier health care system--one for African-Americans, one for white, Anglo-Americans--has been noted since statistics on morbidity and mortality have been collected. African-Americans are more likely to die from or experience heart disease, malignancies, cerebrovascular disease, accidents, pneumonia and influenza, diabetes, liver disease, atherosclerosis, nephritis and related kidney diseases, and homicide than whites.<sup>6</sup> Blacks are less likely to have routine breast exams, pelvic and rectal exams, routine visual acuity tests, urinalysis, hematological workups, pap tests, EKGs, and many other diagnostic tests than their white counterparts.<sup>7</sup> African-Americans still have higher maternal and infant mortality rates, and higher rates of low birth weight and/or premature babies than whites do. They are less likely to receive vaccinations for measles, rubella, DPT, polio, mumps, etc., than whites. African-American mothers are less likely to receive adequate prenatal care, to have health insurance, or to have adequate nutrition during pregnancy. Black children are less likely to have access to adequate care than whites. This same pattern of statistics holds up for practically every minority in the U. S. today--Native Americans, Hispanics, etc.

The existence of a two-tier healthcare system (while not as bad as it was during the first part of the twentieth century) which denies rights basic to exercising other rights deemed essential to participating in society as a full citizen provides the pretext for arguing that the right to health care is a basic right no one should be denied, a right presupposed or implied by other rights. But even more importantly in this discussion is the uneven degree to which minority groups bear the health consequences of toxic substances produced by industry.

It is, of course, possible to get to this conclusion by another avenue. U. S. society has long subscribed to the principle of equality of opportunity. The society has been divided on the issue of whether this principle dictates equality of prospect, simple equality of opportunity, or equality of outcome. If equality of prospect demands at least the expectation that one's treatable health conditions not be allowed to interfere with one's life prospects, and if equality of opportunity entails that at least some attention be given to equality of prospect, then the right to healthcare should be provided on equal opportunity grounds.

Principle 4 demands that society protect to the extent possible individuals from the random harms caused by illnesses. There are good moral and prudential reasons for supporting this principle. First, it has been pointed out often by medical commentators that poverty and associated hunger are proximate causes of infectious disease. This makes the poor, malnourished millions who remain in this country perfect targets for infectious diseases. If allowed to go untreated for minor medical maladies associated with infection, the poor can become mobile reservoirs for disease. California's adoption of Proposition 187 which in effect denied health care and welfare rights to illegal immigrants, prompted the editor of the *Journal of the American Medical Association* to say "hello proposition 187, goodbye, infection control." He was well aware of the implications of lack of access to health care and attempts to control infectious diseases.

## Justice and Health Care

Allan Chase once pointed out that "viruses are color blind. Bacteria do not distinguish between religions."<sup>8</sup> And it has been estimated by Dr. Louis Cooper of the New York University School of Medicine that rehabilitation of the 20,000 brain-damaged children from the 1964 rubella epidemic cost over \$2 billion. If we are to adequately contain epidemics, whether they be of influenza, STDs, bacterial infections, etc., we must have in place a delivery system that ignores the ability to pay in order to treat fairly those who contract randomly distributed illnesses, but also to protect the basic rights of other citizens to be free from disease. Environmentally induced illnesses only make the case stronger.

Perhaps another more palatable way of putting the prudential dimension of this argument is as follows. As Allan Chase has pointed out, "Rising populations of sickly children marked for early graves" may not "constitute a military menace to anyone."<sup>9</sup> But the husbands of women who die prematurely are likely to become more susceptible to the doctrines of the disenchanted and those advocating violence than the "owners of comfortable homes in America's better suburbs." While this argument no doubt commits an informal fallacy, it is certainly attentive to the motivational dimensions necessary to provide the social glue that holds any given society together.

As George Wald once stated, "as lack of money decides one's chance to be born healthy, to survive infancy, to live out one's life span...to grow to one's genetic height, to have one physique rather than another, to be educated in the things one wants to learn..." (and, we might add, to be free from environmental exposure to toxic substances) not only will opportunity never be equal, but health prospects randomly visited upon those who for no reason deserve a better outlook will determine their life strategy outcomes. Equality of opportunity demands that health care and hence good health where possible be made more than the random outcome of a few socioeconomic and genetic and gestational processes. We cannot implement equality of opportunity without equal access to health care. And as Caroline Bird once insisted, "hypocritical insistence that opportunity is really equal is the cruelest form of discrimination. It implies that the loser in any contest has lost through his own ability."<sup>10</sup>

One of the most puzzling oppositions to the right to health care comes from a book published several years ago by Ivan Illich entitled *Medical Nemesis*. In that book, Illich comes closer to being what one writer calls a "medical atheist" than any contemporary student of medical progress.<sup>11</sup> Illich is important as an opponent of the right to health care because he saw more clearly than anyone the clash between industrial civilization and the rights of the individual. He insisted that we face this battle head-on rather than draw it out by adopting patchwork solutions to fixing the present system. Public health cannot be ignored for the sake of perpetuating a techno-industrial civilization that threatens human health and we cannot continue to shore the system up by creating illusions of health by establishing rights which reinforce present harmful trends. He writes:

Although almost everyone believes that at least one of his friends would not be alive and well except for the skill of a doctor, there is in fact no evidence of any direct relationship between this mutation of sickness and the progress of medicine.<sup>12</sup>

Illich goes on to argue that:

The changes in health status are dependent variables of political and technological transformations which in turn are reflected in what doctors do and say; they are not significantly related to the activities that require the preparation, status, and costly equipment in which the health professions take pride.<sup>13</sup>

I cannot develop Illich's position in full here, but what he seems to be arguing in his book is that to adopt the view that we need to extend the right to health care to include universal access to patient care is to choose a social disaster that might result when "health policies reinforce an industrial organization that guarantees ill health."<sup>14</sup> Chemical industry spokesmen who have said that their conflicts over the rights of industry are not just battles but that they are wars underscore Illich's concern. We are only just now discovering how the techno-industrial complex under which we currently live does generate ethical problems regarding the distribution of ill health in our society. The question is, Will we do the right thing and protect our citizens even when we cannot attribute all of the health problems of our society to industrial toxins. Scientists in the coming years will play an increasingly important role in insuring that Environmental Health as one of the Leading Health Indicators in Health People 2010 is secured.

Our predicament in protecting individuals from harms caused by "toxic environments" was precarious enough when the ecological connections between environmental contaminants and human health were opaque, but it is even more precarious when industry spokesmen are allowed to withhold information crucial to citizens who would not willingly expose themselves to harms present in these environments. Hence, for reasons of justice, respect for persons, and utility, I think the case can easily be made that given the status quo, we have a collective responsibility to assume burdens created by withholding knowledge about the harmful effects of industrial products and processes.

#### ENDNOTES

1. As quoted in Edward H. Beardsley's *A History of Neglect: Health Care for Blacks and Mill Workers in the Twentieth Century South* (Knoxville: University of Tennessee Press, 1987), p. vii.
2. See Centers for Disease Control special report, "National Report on Human Exposure to Environmental Chemicals," on its website at <http://www.cdc.gov/nceh/dls/report/>.
3. See "National Report."
4. See PBS on "Trade Secrets" at the following address:  
[www.pbs.org/tradesecrets/problem/bodyburden.html](http://www.pbs.org/tradesecrets/problem/bodyburden.html).
5. See PBS on "Trade Secrets" at:  
<http://www.pbs.org/tradesecrets/problem/children.html>
6. See *Health Status of Minorities and Low Income Groups* (Washington, DC: U. S. Department of Health and Human Services, 1991, p. 28.
7. See *Health Status of Minorities*, p. 49.

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8. See Allan Chase, *The Biological Imperative* (New York: Holt, Rinehart, and Winston, 1971), p. 10.
9. *The Biological Imperative*, p. 10.
10. Caroline Bird, *Born Female* (New York: Pocket Books, 1969).
11. Spencer Klaw, *The Great American Medicine Show* (New York: The Viking Press, 1975), p. 38.
12. Ivan Illich, *Medical Nemesis* (New York: Random House, 1976), p. 13.
13. *Medical Nemesis*, pp. 13-14.
14. *Medical Nemesis*, p. 271.

JUSTICE, DISADVANTAGE, AND ALLOCATION OF HEALTH RESOURCES:  
ASIDE FROM INFLUENCE ON HEALTH,  
SHOULD GENERAL DISADVANTAGE MATTER?

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In the United States health arena, many agree that there is a pressing need for a universal system that provides everyone with preventive health measures and health care for serious health problems.<sup>1</sup> Good moral arguments support establishing such a system.<sup>2</sup> However, there is increasing appreciation that universal availability of health care would not prevent or solve many health problems associated with poverty, low social class, unsafe environments, minority status (such as due to being African American or Hispanic), and other conditions that produce vulnerable populations. Thus, there is also an urgent need to ascertain what we should do about these social determinants of health and then to institute corrective measures.<sup>3</sup>

Disadvantages in availability of health care, education, living conditions, and so forth are morally important because they negatively impact *on health*, health is important in living a good life, and concerns about fairness and equality suggest that people should have fair equality of opportunity to live a good life. However, concerns about disadvantage, health, and fairness also raise the following question that this paper addresses: *Is general disadvantage, aside from its adverse health effects, a reason to give people some priority for resources that benefit health (health resources)?*<sup>4</sup>

It is particularly health's power to help our lives go better—to advance our well-being—that makes health important.<sup>5</sup> And although education, adequate income, and so forth significantly affect health, these factors are also very important because of other ways that they influence well-being.<sup>6</sup>

Suppose that health, education, and the rest are important primarily for their effect on well-being. Assume that as a matter of justice we ought to use societal resources to promote fair equality of well-being or of opportunity for well-being. Then we have a moral reason, in deciding how to allocate health resources, to consider people's disadvantage with respect to both health *and* other means to well-being, including disadvantage conferred by those other means to well-being that is *beyond their impact on health*. That is, people's general disadvantage with respect to means to well-being matters ethically in health resource

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allocations beyond the implications of such general disadvantage for health. Or so I shall argue. (From this point forward, when I talk about general disadvantage I will be referring to its implications for well-being outside of its health effects. And 'general disadvantage' will refer to the composite disadvantage conferred by factors such as limited education, low socioeconomic class, and so forth.)

However, even if justice supports counting general disadvantage in allocation decisions about health resources, it does not follow that we must count general disadvantage when all things ethically relevant are considered. This paper will review a number of objections to counting general disadvantage in allocation decisions. In light of these objections, I conclude that a measure of general disadvantage with respect to well-being should be ignored in the allocation of resources that benefit health.

In this paper, I assume for purposes of discussion that a principle of fair equality of well-being or fair equality of opportunity for well-being should guide our decisions about allocations of health resources. Fair equality here is a substantive notion of equality that means not mere equality—we can be equally poor or unhealthy—but rather equality in a substantial level of well-being or opportunity for it.<sup>7</sup> Of the two principles, I will show that fair equality of opportunity is preferable.

A full account of justification for such a principle of fair equality would be lengthy and much beyond the present scope. Instead, I simply assert that our concerns for justice and substantive equality support something like a principle of fair equality of well-being or the opportunity for it.<sup>8</sup> And if we hold that any similar principle is relevant to allocations of health resources, it is important to decide whether general disadvantage should influence those decisions. We should not simply assume that only health should matter in allocations of health resources.

The paper proceeds as follows: After sketching a working account of well-being, Section One explains why fair equality of opportunity for basic means to well-being, not fair equality of well-being, should be the suitable guiding principle for allocation decisions, if any such principle should act in this way. Section Two shows why we have a reason to consider general disadvantage (called 'global opportunity') in allocation of health resources. Finally, Section Three considers a number of objections to factoring global opportunity into allocation decisions about health resources.

### 1. 0 Well-being and Fair Equality

To decide whether well-being or opportunity for well-being should enter into decisions about the allocation of health-care resources, we first need an explanation of well-being so that we can understand what we are deciding about. Developing an adequate account of well-being has been more difficult than we might suspect.

#### 1. 1 How To Indicate Well-being

Early utilitarian accounts attempted to explain well-being in terms of positive mental states like pleasure or happiness, but outcomes can affect how our lives go regardless of their influence on our mental state.<sup>9</sup> Such difficulties led to suggestions that satisfaction of 'actual' desires or preferences explains well-being. However, ignorance, flawed concepts, false beliefs, and faulty reasoning often mislead us about what will make our lives go best.

These problems motivated proposals that satisfaction of 'corrected' or 'informed' desires—desires that rest on full information or at least substantially more information than people would ordinarily have,<sup>10</sup> sound concepts, and good logic—would make people's lives go best.<sup>11</sup>

Theories stressing satisfaction of either actual or informed desires share 'the expansiveness problem' that although we may desire anything, satisfaction of many desires will not affect our lives. For example, fulfillment of a present desire that people live on the planet Mars in the 23<sup>rd</sup> century would not affect our well-being. However, if we had expended great effort on such a project, its posthumous success *would* mean that our life had gone better. Thus, non-experienced outcomes that we desire *and* promote can affect well-being. (Griffin, 1986)

To explain well-being, we need further clarification of how to choose among all the possible objects of desires. James Griffin's useful suggestion is that people's lives go better the more they manifest the 'prudential values' of accomplishment, multiple features of agency (autonomy, basic functional capabilities and the goods to maintain them, liberty, and various specific freedoms), enjoyment, understanding, and deep personal relations.<sup>12</sup> (Griffin, 1986, p. 67) In Griffin's view, to make their lives go best individuals should manifest the prudential values according to their particular character, psychology, narrative, context,<sup>13</sup> and conceptions of the good. (Griffin, 1986, p. 107)

Griffin's account of well-being is very plausible. And in the stress on informed consent in the health arena, we find support for Griffin's explanation of what makes our lives go best. As Dan Brock emphasizes, being autonomous per se is a feature of well-being and people's autonomous choices—especially if based on adequate, understood information—usually best determine what health-care options will make their lives go best. (Brock, 1993)

## 1.2 Interpersonal Comparisons of Well-being

To decide whether an indicator of people's general well-being should factor into decisions about allocations of health-care resources, let us take Griffin's explanation of well-being as a plausible departure point. Immediately, it is clear that we should not factor a direct assessment of well-being into such decisions. First, as Griffin observes, only an individual and close acquaintances would have sufficient knowledge about that person to determine what stress on each of the prudential values would best promote that person's well-being. And without this knowledge we would not know what resources to give the person. Second, even if we could get such knowledge, to acquire it and distribute resources accordingly would be bureaucratic nightmare. Third, it is uncertain that we can find an objective 'yardstick' for making interpersonal comparisons of well-being.<sup>14</sup> Fourth, if distributions of public resources are based on desire satisfaction, the 'expensive-tastes' problem arises.<sup>15</sup> For instance, if our goal were to promote equality of well-being per se, then we would sometimes be required to give more resources to people merely because they preferred expensive things such as fine jewelry, markedly limiting resources available for important basic means to well-being such as health care and education.

### 1.3 Opportunity for Basic Means to Well-being

If we instead focused on *opportunity* for *basic means* to well-being such as education and health-care resources that virtually everyone needs to make their lives go best, we would avoid the need for highly personalized knowledge and the expensive tastes problem. Furthermore, if provision of opportunity for basic means to well-being includes providing people reasonable equality of access to such opportunity *and* educating them to take advantage of basic means to well-being, and we should include such access and education, then we would reduce inequalities in people's well-being due to people's psychological conditioning to be satisfied despite being very disadvantaged.<sup>16</sup>

### 2.0 Global Opportunity and Allocation of Health-care Resources

In light of the above discussion, let us assume that our social justice goal is to provide people fair equality of opportunity for basic means well-being. Such basic means would include health, education, freedom from poverty, and so forth.<sup>17</sup> Take such equality to be fair when at least the following criteria are fulfilled: First, there is significant 'substance' to the basic means to opportunity that should be provided.<sup>18</sup> Second, we provide people reasonable access to the basic means. Third, we go to reasonable lengths to educate people to take advantage of the basic means.<sup>19</sup>

In distributing resources, the usual strategy is to allocate health resources according to health or health-care needs, education resources according to education needs, and so forth. And common sense suggests that given the complexity of our society and the size of government bureaucracies that already exist to promote health, education, and the rest, each of these basic means to opportunity for well-being are best addressed in 'separate spheres'. However, if fair equality of opportunity for basic means to *well-being* is our primary goal, then health is secondary in importance to well-being.

Our ultimate concern is not with health, but with well-being. Furthermore, our fundamental goal with regard to opportunity for well-being is to provide people equality of opportunity for their lives to go well as wholes—their overall opportunity. If health is important primarily because it is a means to well-being, and if our main concern is with overall opportunity, then we have a fairness basis for arguing that people with worse global or overall opportunity for basic means to well-being sometimes should get priority for scarce health resources even if they have equal or better health than individuals that have better overall basic means to well-being. That is, the goal of fair equality of opportunity for basic means to well-being could sometimes justify giving priority for scarce health resources to people with better health. Thus, consideration of global opportunity could lead to a radical change in how we distribute scarce health resources.

### 3. 0 Objections to Global Opportunity

Considerations of fairness and substantive equality give us a reason to factor people's global opportunity into decisions about the allocation of health resources. However, other important moral considerations may provide opposing reasons. Section Three addresses ten objections against counting global opportunity in allocation decisions.

### 3.1 Objection: As fairness does not require whole-life comparisons, consideration of global opportunity is not mandatory in allocation decisions.

The principle of fair equality of opportunity for basic means to well-being applies over people's complete lives. As Thomas Nagel writes in *Equality and Partiality*, "the subject of an egalitarian principle is not the distribution of particular rewards to individuals at some time, but the prospective quality of their lives as a whole, from birth to death (a point stressed by Rawls)." (Nagel, 1991, p. 69) Nagel's comment suggests that for purposes of decisions about allocations of resources, people should be compared with respect to global opportunity over their complete lives. However, it is empirically possible that allocation decisions based on whole-life comparisons of global opportunity would advance people's substantive equality of opportunity over their complete lives *less than* would decisions based on comparisons at points in time or on comparisons of time periods that cover less than whole lives.

This objection is correct about the empirical possibilities, but concern for people's equality of opportunity over their complete lives does not logically require us to consider differences in opportunity over their complete lives when making allocation decisions. If consideration of global opportunity at points in time or less-than-complete-life periods of time would produce more equality of opportunity, then global opportunity assessments at such times should be employed. Thus, how we should apply the principle of fair equality of opportunity for basic means to well-being can depend on predicted outcomes.

### 3.2 Objection: Health is a Separate Sphere—Walzer

Michael Walzer argues in *Spheres of Justice* that the notion of relatively autonomous or separate spheres best captures "the plurality of social meanings and the real complexity of distributive systems." (Walzer, 1983, p. 13) For Walzer, spheres are social or governmental entities that distribute different social goods. In his account, spheres are separate when each sphere distributes its goods without regard to how other spheres distribute their goods. In short, Walzer's argument is that because (1) the criteria for fair inequalities vary among distribution spheres<sup>20</sup> and (2) possession of greater amounts of some social goods like property has given people power to control the distribution of goods in other spheres, promoting unjust inequalities, distribution spheres should be kept separate or autonomous.

With regard to the health sphere, Walzer argues that health-care resources should be distributed strictly according to people's health-care needs, ignoring other social needs or disadvantages, because we now view healthy bodies as good *per se*.<sup>21</sup> That is, the ultimate goal of health-care resources is to improve health.

Walzer is incorrect. We want to live longer and healthier lives mainly because good health enables us to pursue valued life plans and maintain caring relationships, among other things. Health *per se* is not our primary goal. Thus, our concern with health *does not* mean that we should ignore global opportunity in the allocation of health-care resources.

Walzer is correct that health should be a separate sphere in the sense that we should not allocate more of other social goods such as education to people merely because they are healthier. Considering health in this way would promote unjust inequalities, but factoring global opportunity into allocation decisions would actually promote giving health-care resources to people that have worse health or less of other social goods.

### 3.3 Objection: Consideration of Global Opportunity Would Corrupt the Good That Is Health—Kamm and Kass

Frances Kamm writes that a reason to ignore nonhealth issues in allocations of health-care resources flows from the idea that health is a good-in-itself. (Kamm, 1993, p. 259) In his *Toward a More Natural Science*, Leon Kass argues that health is a good-in-itself because (he contends) health is a 'natural standard' that represents "the 'well-working of the organism as a whole,' or again, 'an activity of the living body in accordance with its specific excellences.'" (Kass, 1985, p. 174) Thus, for Kass, an organism's health is objectively good rather than "a good whose goodness exists by convention or human decree." (Kass, 1985, p. 168)

However, even if health is a good in itself, much of health's moral importance lies in its power to enable people to pursue plans and engage in relationships that foster their well-being. In fact, Kass admits later in his discussion that health per se is less important than a "good and worthy life." (Kass, 1985, p. 186) Thus, it is false that we should ignore global opportunity in allocation decisions because doing so would corrupt the good that is health.

### 3.4 Objection: Consideration of Global Opportunity in Allocation Decisions Would Violate a Kantian Injunction<sup>22</sup>

Another objection is that if global opportunity factors into allocation decisions, we violate the Kantian injunction against treating people solely as means to ends because the envisioned principle of fair equality of opportunity has implications about disadvantage *and* efficiency. In regard to the principle, fairness relates to disadvantage, number of people benefited, and amount of benefit. For example, if there were equally needy people and we could benefit one or many equivalently with some resources, and if all else were equal, it would be unfair to use the resources to benefit just the one person. Also, benefits can be direct or indirect. As used here, benefits are indirect if they occur in other people because someone else is directly benefited. For instance, directly benefiting people by curing their diseases can indirectly benefit their families.

On its face this principle of fair equality of opportunity counts indirect and direct benefits equally. Thus, the principle gives us a reason to save or improve the lives of people who would make significant contributions to the education or health of others (as basic means to well-being) rather than save or improve the lives of people who would contribute less to others' lives. That is, the principle apparently implies that people whose lives have less 'social worth' should get lower priority for health-care resources.

In regard to an analogous case, Frances Kamm argues that withholding health-care resources from people simply because they can produce less indirect benefits is to treat them solely as means, violating the Kantian injunction against doing so. (Kamm, 1993, p. 111)

Kamm is incorrect. In such cases we would not be treating people solely as means because in deciding who should get priority for resources we would be counting indirect *and* direct benefits. The direct benefits would include benefits to those who, if directly benefited, would benefit others. This is to treat everyone as means as well as ends. Thus, the Kantian injunction is not violated.

With regard to indirect benefits, this objection continues that regardless of whether it would call for violating the Kantian injunction, the principle of fair equality of opportunity has the apparently reprehensible implication that resources should go to people of greater 'social worth'. For example, we would be required to give priority to many people with children and those with jobs that contribute to the well-being of others. To do this would violate other notions of fairness and equality. So continues the objection.

The objection is correct that such a principle of fair equality would imply counting social worth. And in many situations there are good moral reasons to avoid counting social worth. However, the principle would not require us to count social worth because the principle at most would give us a *prima facie* reason to consider indirect benefits. I am not assuming that this opportunity principle would be absolute. Other moral considerations can give us reasons to ignore indirect benefits. And because the *prima facie* status of our reasons to count indirect benefits allows other things to count morally, this objection about indirect benefits does not defeat the principle of fair equality of opportunity for basic means to well-being. And if the principle is not defeated, the objection has not shown that global opportunity should always be ignored in allocation decisions.

### 3.5 Objection: We Discount Past Pain and Suffering

This objection observes that past pain and suffering per se are unimportant to us, although unpleasant prior events may cause us present distress.<sup>23</sup> For example, many, for themselves or others, would prefer that a painful event be in the past rather than in the future. If past suffering per se is unimportant to us then we should ignore past opportunity disadvantages and focus on future ones. Thus, if global opportunity should count in allocation decisions, past opportunity should be ignored. So goes the objection.

However, our discounting of past pain and suffering is incomplete. We sometimes regret others' past suffering even after they are dead.<sup>24</sup> Furthermore, past opportunity profoundly influences future opportunity. Finally, a principle of fair equality of opportunity for well-being invites whole-life comparisons and from a whole-life view, people's psychological adjustment to prior disadvantage reduces but does not eliminate the importance of that disadvantage.

### 3.6 Objection: It Is Unclear That We Can Develop a Satisfactory Index for Assessing Global Opportunity

We saw in Section One that to compare people's well-being, we need some kind of objective measure or index, but it is unclear that we can develop such an index. A similar problem arises in attempting to assess people's global opportunity for basic means to well-being. For such assessments, we would need a common metric for weighing the different basic means to opportunity. In theory, opportunity is a common ground that should make such measurements possible.<sup>25</sup> However, we lack, and it is unclear how to establish, an objective *and* specific common standard for valuing basic means to opportunity such as education, health care, and freedom from racial discrimination. Also, ideally we should factor in the partial interdependence of the different basic means, such as how education influences taking advantage of health-care options. But, assessing such interaction would

make our task even more daunting. Furthermore, the importance of basic means can vary among contexts, adding further complexity.

Lacking an objective standard, we might turn to people's preferences to establish such an index. However, different perspectives among groups, partly related to differences in experience, tradition, culture, or context, may lead to quite different valuations of basic means to opportunity. And if we turn to preferences, we again face the problems of expensive tastes and conditioned preferences that we tried to avoid in developing a satisfactory account of well-being. Finally, if we assess people's preferences we will need to decide whether minority interests need protection. Thus, it is indeed unclear that we can develop a satisfactory index for assessing global opportunity.

### 3.7 Objection: Tracking Opportunity May Reduce People's Opportunity

Assuming that we solve the index problem, to factor people's global opportunity into allocation decisions would require a national data bank that tracks everyone's health-care access, educational opportunity, freedom from discrimination, and other basic means to opportunity *over their complete lives*. Illicit use of such data could significantly *reduce* people's opportunities, such as for jobs and insurance. Thus, tracking such data in order to promote fairness might reduce people's opportunity for well-being. Furthermore, the most disadvantaged are least able to protect their own interests in such situations. This is another important objection. It is beyond the present scope to assess how severe this problem might be, but I suspect that it would be significant.

### 3.8 Objection: Tracking Opportunity May Reduce Personal Liberty

The right to limit what is revealed about oneself is an important aspect of personal liberty. As tracking global opportunity would enable violation of this right (shown in the previous objection), personal liberty is a component of agency, and agency is a feature of well-being, establishing the apparatus for factoring global opportunity into allocation decisions may actually reduce well-being. And compared to the more advantaged, the most disadvantaged already must reveal more personal information in order to qualify for food stamps, public housing, and the like. Thus, the personal tracking needed to determine global opportunity could make some people even more disadvantaged.

However, if global opportunity figured into allocation decisions, the losses in well-being due to further losses in personal privacy among the worst off might be offset by benefits from greater priority they might get for health-care resources. And better access to health-care resources, by improving their health, would increase their substantive freedom because poor health restricts what we are at liberty to do. Thus, the most disadvantaged could have a net gain of well-being if global opportunity were tracked. But it is unclear that the worst off would experience such a net gain. Also, tracking aspects of global opportunity probably would promote violation of privacy rights of the more advantaged majority. These considerations suggest that the threat to personal liberty is an important reason to avoid tracking global opportunity.

### 3.9 Objection: Counting Global Opportunity Will Erode Public Trust and Professional Commitments

Another objection asserts that factoring global opportunity into allocation decisions would erode public trust and demoralize health-care providers because these professionals believe that only present and future health, and expected health benefits, are important in deciding what resources to give their patients. Although the incidence and severity of health problems increase as global opportunity declines, exceptions are common.<sup>26</sup> Thus, if prior global opportunity affected decisions about delivery of personal medical services (resources provided to specific individuals for particular health problems), people with minor health problems might often get greater priority for resources than people with severe health problems. Hence, the ill could not assume that they would get health care when they needed it and providers could not assume that they could give it. This uncertainty would increase public distrust in our health-care system and demoralize health professionals. Demoralization in health professionals would promote cynicism and departure from the health field. And cynicism leads professionals to give less humane and less effective health care. Thus, considering global opportunity in allocation decisions could have counterproductive effects on health and opportunity for well-being. So goes the objection.

In response, it is our moral obligation to *change* attitudes and dispositions that sustain unfair practices (assuming that it is unfair to ignore global opportunity, all things considered). And we might be able to change such attitudes and dispositions. But if the ill cannot assume that their physicians, nurses, or other health-care providers will usually provide them health-care for serious health problems, this uncertainty will further erode the *already eroded* relationship between patients and health professionals. Good relationships with providers are important for healing. Thus, considering global opportunity in the delivery of personal medical services likely would worsen people's health outcomes and their opportunity for well-being. In sum, the objection makes a good point that consideration of global opportunity in provision of personal medical services would be counterproductive.

However, if a universal health-care system provided people care for most health problems, health professions probably would need to factor global opportunity into decisions about personal medical services in only a limited range of cases. Such limited consideration of global opportunity probably would not foster general public mistrust or major demoralization of health professionals. In such a system, education could more easily lead the public and professionals to see the fairness of considering global opportunity in selected kinds of cases, assuming that we solved the index problem. However, changing such attitudes might be very difficult. And if the range of relevant cases is quite restricted, it is unlikely that enough benefit would be produced to justify all the apparatus needed to consider global opportunity.

We might avoid much of the potential public distrust and health professional demoralization by restricting consideration of global opportunity to allocations that affect public health. To be sure, allocations from a public-health perspective would influence people's health and longevity, but only in a statistical way. Individuals could remain confident that their health problems would get treatment. However, restriction to public

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health would reduce the benefit of applying global opportunity and would not prevent the problems raised by objections 3.6 to 3.8, and as we will see, by 3.10.

### **3.10 Objection: Factoring Global Opportunity into Allocation Decisions Would Be Inefficient and Prone to Error**

Suppose that we factored global opportunity into decisions about allocations of resources for public health. Imagine that global opportunity was calculated from people's opportunity for health care, education, and employment without racial discrimination. Tracking this information would require huge databases and complex inter-institutional information flow. Significant oversight and quality control would be needed to minimize error and corruption. Bureaucracy and costs would increase. Consideration of other basic means to opportunity would further increase bureaucracy and costs. And such bureaucracies and costs would use resources that could instead improve the health of the public.

The counterproductive outcomes predicted in this objection would be quite likely. And such outcomes would be even more significant if global opportunity were factored into decisions about delivery of personal medical services.

### **3.11 Summary Comment about the Objections**

Objections 3.1 to 3.5 failed to show that global opportunity should be ignored in allocation decisions. Objections 3.6 to 3.10 all make strong points against consideration of global opportunity. In sum, they show that we should ignore global opportunity in allocation decisions about health resources.

## SUMMARY AND CONCLUSIONS

This paper examined whether a measure of people's general disadvantage should influence allocations of health resources (resources that benefit health). Many nonhealth aspects of general disadvantage, such as low socioeconomic class and limited education, adversely influence health. However, the paper's focus was on features of general disadvantage outside of their health effects.

To gain leverage in the analysis, I suggested we assume that a principle of fair equality of well-being or opportunity for well-being should guide allocations of health resources. In support of assuming such a principle, I asserted that many of us support providing people fair or substantial equality of well-being, or of opportunity for well-being.

To set background, Section One outlined prior, flawed attempts to explain well-being. It then sketched James Griffin's account of well-being and gave reasons to think that it is a plausible explanation. In light of Griffin's account, I showed that rather than equality of well-being, people's opportunity for basic means to well-being is the appropriate indicator of general well-being in allocation decisions, if any measure of general well-being should be so employed. Thus, for purposes of discussion we assumed that a principle of fair equality of opportunity for basic means to well-being should guide allocations of health resources.

Section Two explained that because health's importance lies mainly in its potential influence on well-being, rather than in health per se, a principle of fair equality of opportunity for basic means to well-being provides a reason to factor people's global

opportunity—their lifetime-composite opportunity for basic means to well-being—into decisions about allocations of health resources. That is, there is a reasonable moral argument that non-health aspects of general disadvantage (global opportunity) ought to influence allocations of health resources. To repeat, the focus was on aspects of global opportunity outside of those aspects' influence on health.

If people's global opportunity influenced allocations of health resources, this would be a radical change. Section Three considered ten objections to factoring people's global opportunity into such allocation decisions. The first five objections were unsuccessful. In brief, these failed objections claimed that:

- As fairness does not require whole-life comparisons, consideration of global opportunity is not mandatory in allocation decisions.
- Health is a separate sphere—Walzer's argument.
- Consideration of global opportunity would corrupt the good that is health.
- Consideration of global opportunity in allocation decisions would violate a Kantian injunction.
- We discount past pain and suffering.

In contrast, the following five objections were successful:

- It is unclear that we can develop a satisfactory index for assessing global opportunity.
- Tracking opportunity may reduce people's opportunity.
- Tracking opportunity may reduce personal liberty.
- Counting global opportunity will erode public trust and health professional commitment.
- Factoring global opportunity into allocation decisions would be inefficient and prone to error.

In regard to the penultimate objection, we found that it probably would not apply to public health, but limit to public health would also limit the potential benefit of considering global opportunity in allocation decisions. Furthermore, the other problems raised by the last five objections would stand.

I judge that the last five objections, in sum, strongly suggest that when deciding who should get priority for health resources, we should ignore disadvantages in people's other basic means to opportunity for well-being insofar as those other disadvantages do not influence health.

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#### ENDNOTES

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<sup>1</sup> As I use the term, the health arena includes issues related to provision of personal medical services, public health, research about health and health care, and other aspects of health.

<sup>2</sup> The literature in this area is extensive. Dan Brock and Norman Daniels recently provided a good summary of ethical justifications for a universal health-care system. (Brock & Daniels, 1994)

<sup>3</sup> How we should respond to social determinates of health is a question that needs much greater attention among people addressing bioethics issues. (Brock, 2000a)

<sup>4</sup> In personal discussion, Dan Brock pointed out the importance of addressing whether general disadvantage should affect allocations of health resources. He provided many helpful suggestions in response to related work of mine on this topic. Jamie Dreier also had several useful comments.

<sup>5</sup> See Brock on health's role in fostering well-being. (Brock, 1993) In taking 'well-being' as meaning what makes our lives go best, I follow Parfit. (Parfit, 1984, p. 493)

<sup>6</sup> Considerations of justice and equality give us a reason to use health resources to reduce nonhealth disadvantages, such as poverty, because such disadvantages adversely affect health. Whether we should use health resources in this way depends on many factors. I am not addressing this issue here.

<sup>7</sup> In this notion of fair equality as substantial equality, I follow John Rawls' usage in *A Theory of Justice*. (Rawls, 1971)

<sup>8</sup> Considerable work has attempted to discern how, from a justice perspective, we should allocate resources that benefit health. In my judgment, the most influential modern account is Norman Daniels' *Just Health Care*. (Daniels, 1985) Daniels' theory, based on a Rawlsian principle of fair equality of opportunity, although with important differences from Rawls' opportunity principle, has generated much commentary and several alternative accounts. I cannot address that literature here. (Daniels' opportunity principle is somewhat different from the one I assume in this paper.)

<sup>9</sup> Nozick's well-known 'experience machine' example is helpful in thinking about this. He describes a machine that enables people to pick the mental experiences that they desire—that they are successful, that they go to the moon, and so forth. (Nozick, 1974, pp. 42-5) People are then essentially put in a state of suspended animation in which they only think that they have the experiences. The mental experiences that they choose will presumably give them

positive mental states like happiness or pleasure unless they are masochists. Every few years they awaken just long enough to pick out a new set of future mental experiences. The experience machine example shows that our lives could go very badly even if we have joyful experiences.

<sup>10</sup> As Griffin points out, less than full information is sometimes best for well-being. For example, individuals very stressed by making health decisions may best advance their well-being by autonomously delegating review and assessment of health-care options to others.

<sup>11</sup> How best to 'correct' people's preferences is debatable. 'Full information' accounts explain well-being in terms of the lives persons would choose if they could accurately and completely survey what it would be like to live all the lives possibly or reasonably open to them. However, the perspective needed to *reap the full benefit* of different sorts of lives appears incompatible with any perspective that would allow us to choose among those possible lives. Also, the order in which we consider alternative lives may change our weighting of different lives. In regard to these complex issues, see Sobel's and Rosati's helpful analyses and literature reviews on this topic. (Sobel, 1994; Rosati, 1995)

<sup>12</sup> In Griffin's account, 'deep personal relations' apparently occur among equals, because he refers to "reciprocal relations of friendship and love." (Griffin, 1986, p. 67) However, well-being also flows from deep personal relations among people with unequal status, such as between parents and children.

<sup>13</sup> An important question is whether in a society that places greater stress on community values than on personal choice, Griffin's account would explain well-being. In brief, I think that Griffin's inclusion of context may let him accommodate this concern. Space does not allow exploration of this issue here.

<sup>14</sup> Griffin as I understand him is agnostic about whether interpersonal well-being comparisons are possible. (Griffin, 1986, p. 119)

<sup>15</sup> The classic paper on how to decide what desires we are morally obligated to fulfill, if any, is T. M. Scanlon's "Preference and Urgency." (Scanlon, 1975) Also, Scanlon's later "The Quality of Life" gives helpful clarifications. (Scanlon, 1993) Useful as well is Griffin's discussion of the relation of expensive tastes to 'basic needs'. (Griffin, 1986, pp. 51-3)

<sup>16</sup> A social justice concern beyond the present scope is that people vary considerably in their ability to convert social goods into valued ends. For example, Amartya Sen has extensively discussed the moral implications of people's variable ability to convert social resources into good outcomes, particularly with respect to John Rawls' social primary goods. See especially Sen's *Inequality Reexamined*. (Sen, 1992)

<sup>17</sup> Obviously, what we put on the list of 'basic means' is very important. However, I put this issue aside.

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<sup>18</sup> This notion of fair equality builds on the concepts of fair equality of opportunity advanced by John Rawls and Norman Daniels. (Rawls, 1971; Daniels, 1985)

<sup>19</sup> Of course, what would be 'reasonable access' and 'reasonable lengths' can be difficult to determine and controversial. I cannot address this issue here.

<sup>20</sup> Walzer speaks of the social goods having different 'social meanings'.

<sup>21</sup> I take this as the point he makes when he writes that we now see "disease itself . . . as a plague." (Walzer, 1983, p. 88)

<sup>22</sup> This discussion draws heavily Dan Brock's "Separate Spheres and Indirect Benefits." (Brock, 2000b) Brock's comments in part address Kamm's arguments in her *Morality, Mortality*, Vol. 1, especially pages 106-112. (Kamm, 1993)

<sup>23</sup> This section's discussion is indebted to Parfit's account in *Reasons and Persons*. (Parfit, 1984, p. 165-86)

<sup>24</sup> On this point see Parfit's discussion about his responses to his mother's hypothetical suffering. (Parfit, 1984, pp. 181-84)

<sup>25</sup> Davidson shows this convincingly in an essay addressing the general possibility of interpersonal comparisons. His remarks apply to opportunity-based comparisons. (Davidson, 1986)

<sup>26</sup> There is a good correlation between disease incidence and poverty, for example. (Davis, 1993) Diseases in those with worse global opportunity are also likely to be more severe at presentation and more refractory to treatment.

## WHAT STANDARD FOR THE STANDARD HMO GATEKEEPER?

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In 1998, the United States devoted 14% of its Gross National Product (GNP) to health care, twice what it spent on national defense.<sup>1</sup> It is estimated that the U.S. will expend over 1.7 trillion dollars or over 18% of the GNP on health care this year.<sup>2</sup> Nevertheless, as many as 40- million people or 15% of the U.S. population enjoy no health care coverage,<sup>3</sup> many of whom are children, within family units with at least one full time employed member.

In addition, the U.S. expends more of its financial resources on health care than any other country; out-spending Canada, Germany, and Japan by at least 40%.<sup>4</sup> Yet, these countries are capable of affording universal health care coverage for their respective citizens.<sup>5</sup>

Moreover, today, approximately two-thirds of those who enjoy health insurance coverage secure such coverage through their employers.<sup>6</sup> Such coverage is increasingly expensive for employers. In 1965, employee health care costs consumed only 8% of pre-tax employer profit. By 1989, that percentage had grown to 56% and it is estimated to reach 74% by the year 2000.<sup>7</sup>

How the U.S. health care system is the world's most expensive and yet fails to cover such a significant portion of its population, is the subject of much speculation. One suspected causal antecedent is waste. It is estimated that as much as 25% of the U.S. health care allowance may be consumed through waste, one form of which is unnecessary administrative costs.<sup>8</sup> Another reported form of waste is unnecessary medical procedures and underutilized facilities.<sup>9</sup> Without significant difference in the quality of care, the U.S. spends much more per citizen than does Canada.<sup>10</sup> It is estimated that the recapture of the wasted quarter of the health care budget would be sufficient to cover the 15% of the U.S. population who are without insurance.<sup>11</sup> Some believe that this might be accomplished simply through the employment of a single payer system.<sup>12</sup>

A second suspected factor contributing to the high and escalating cost of U.S. health care is medical malpractice. It is estimated by the American Medical Association that unnecessary medical treatment ordered as defensive medicine,<sup>13</sup> i.e., medical care prescribed not for medical reasons but solely to avoid malpractice claims, may add as much as \$15 billion per year to the cost of health care.<sup>14</sup> Some have maintained that defensive medicine not only contributes to the rising cost of health care, but that the excess medical services actually influence the medical standard of care in a fashion that runs counter to many cost-

containment measures.<sup>15</sup> It is, of course, quite true that the extent and influence of defensive medicine has been solidly questioned as of late. For example, it has been suggested that the extent of actual medical malpractice far exceeds the number of malpractice suits and that malpractice premiums show little verisimilitude to the number of malpractice claims.<sup>16</sup>

A third and arguably significant contributing factor to the high and ever rising cost of health care is health-care-provider financial self-aggrandizement.<sup>17</sup> Where physicians control referrals and may augment their financial income through such, they generally will. Perhaps more than fear of malpractice, physician financial interest in down-stream health care providers tends to excite unnecessary referrals.<sup>18</sup>

Other factors, such as the advancement and proliferation of technology, demographic changes in the U.S., and rising professional incomes, appear to contribute (some more than others) to the crisis in U.S. health care.<sup>19</sup>

One extremely popular and effective method of containing health care costs while also affording a wide range of service for an ever increasing yet specified range of the population is managed care. Managed care is generally characterized as an integrated health care delivery and health care financing system. The fully integrated managed care system is a cost-containment strategy that, at least in principle, is intended to eliminate unnecessary service (i.e., waste); by eliminating or reducing over-utilization of medical resources through the alteration of practitioner and provider incentives.

The forms of Managed Care are varied but, in general, all offer more or less prepaid, preauthorized health care conjoined with cost incentives designed to reduce health care spending.<sup>20</sup> Indeed, according to the industry's own definition, "Managed Care alters the decision making of Physicians and Hospitals by interjecting a complex system of financial incentives, penalties, and administrative procedures into the doctor-patient relationship."<sup>21</sup>

The least radical Managed Care manifestation is the Preferred Provider Organization (PPO) which contracts with Providers and Practitioners to provide discounted, fee-for-service health care to enrollees. The Exclusive Provider Organization (EPO) differs from the PPO in that the EPO enrollees are not financially covered when they receive health care attention from non-contracted Providers or Practitioners.

The more radical form of Managed Care Network is the Health Maintenance Organization (HMO). The variety of HMOs is considerable. For example, staff model HMOs employ practitioners at a certain location while group and network model HMOs contract with pre-existing professional corporations or partnerships to provide health care to enrollees. Individual Practice Associations (IPA-HMOs) are arrangements whereby the HMO contracts with an IPA, which in turn contracts with individual practitioners to provide health care to HMO enrollees.

Managed Care Organizations, particularly HMOs, employ a combination of incentives to promote reductions in medical care utilization. Perhaps most importantly, HMOs are paid and frequently pay contract practitioners in a fashion that at least partially shifts the financial risk from the payer of health care to the provider and the practitioner. For example, unlike a traditional fee-for-service payment method, which essentially encourages increases in the volume of services, HMOs and at times the contracted practitioner, are paid on a capitated basis.<sup>22</sup> A capitation payment system discourages the

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utilization of health care services by initially presenting the HMO with a fixed amount for each enrollee for a given period. With a reduction in the fixed financial amount with each increase in the volume of services, there will be a trend toward under-utilization.

HMOs employ additional cost containment measures that have proved generally effective yet somewhat troublesome. For instance, HMOs frequently withhold a certain portion of the practitioner's income (usually around 20%) until the end of the year at which time the withheld portion is returned to the practitioner if, but only if, the HMO is not functioning at an economic loss.<sup>23</sup> Additionally, in order to cover HMO referrals to specialists (who are more likely to be paid on a fee-for-service basis) the HMO will create a referral fund. Yet, in order to discourage referrals to specialists, the HMO will generally offer contracted general practitioners a percentage of the unused funds at the end of the year.<sup>24</sup>

One of the more controversial HMO cost containment measures is the employment of gag orders.<sup>25</sup> Such orders, secured through HMO-practitioner contracts, proscribe practitioner disclosures to enrollees concerning medical options not offered by the HMO and about more expensive medical alternatives to those the HMO is presently recommending. Gag orders have also been used to require practitioner silence about both practitioner incentives and gag orders themselves.

Perhaps besides paying practitioners on a capitated basis, the most efficacious HMO method of abating resource utilization and thereby costs, is the employment of the so-called "gatekeeper." The gatekeeper, generally a general practitioner or primary care physician, is responsible for managing the HMO's health care financial resources by, among other duties, determining the proper allocation of said resources to enrollees. Gatekeepers determine the distribution of services to the enrollee, e.g., whether a referral to a specialist is appropriate for the enrollee. Gatekeepers, frequently paid on a capitated basis, can also be subject to all the above-mentioned cost incentives.

Notwithstanding the healthcare dangers of under-utilization, the cost savings afforded by Managed Care Networks, in general and HMOs in particular, have proved exceptionally enticing to payers in the health care market. It is estimated that HMOs now account for over half of all privately insured individuals.<sup>26</sup>

Nevertheless, not all of the empirical studies of HMO health care delivery and enrollee satisfaction have been complimentary. The empirical evidence concerning the effective delivery of quality health care by HMOs is, at best inconclusive and/or equivocal.<sup>27</sup> Thus, the purpose of this note shall be to explicate and examine this problem and, at least some of its ramifications. To that end, section II shall be devoted to the delineation of the contingent conditions for the problem and its development. In section III, the problem shall be discussed and various arguments for its resolution addressed.

## II

Three models have served to determine the standard of due care for practitioners and providers of health care. The strict and similar locality rules would set the standard of due care owed by practitioners and providers to patients at the level demonstrated by other reasonable and prudent practitioners and providers within that particular or similar locality,

respectively. The national standard would fix the standard of due care by the reasonable and prudent practitioner and provider in the national theatre.

In favor of the generally accepted national standard of due care, courts have noted that national standards for medical education, accreditation, and certification give a national flavor to medical care, irrespective of the particular locality of implementation.<sup>28</sup>

The national standard does, however, acknowledge resource limitations of a particular locality. Concerns of a particular locality may modify the national standard when those concerns are circumscribed in terms of physical resources. Given that "ought" implies "can," a health care practitioner can not be held liable for failing to perform a particular service if the physical prerequisites for said performance are absent.

Aside from the physical resource limitation on the practitioner and provider, it has been considered an accepted principle of the medical profession that once a person is accepted as a patient, then "whether the patient be a pauper or a millionaire, whether he be treated gratuitously or for reward, the physician owes him precisely the same measure of duty and the same degree of skill and care."<sup>29</sup>

This principle has, in the face of medical cost containment, been somewhat modified of late. Professor E. Haavi Morreim has distinguished between the standard of medical expertise on the one hand, and the standard of resource use, on the other.<sup>30</sup> The former, according to Morreim, is that which is owed equally to all parties accepted as patients or enrollees. The latter, however, like the physical resource limitation upon the accepted standard of care, is determined not only by what is physically available but, because the practitioner is in no lawful position to misappropriate another's property, is determined by what is financially covered by the patient's health care payer. That is to say, physicians are generally excused at law from breaches of the accepted standard of care when due to no fault of their own, but due to the unavailability of necessary physical resources. As a continuation of this general law principle, Morreim contends that practitioners are in no position to extend physical resources to patients or enrollees when those resources are physically available but not financially covered by the health care consumer's health insurance. The physician, after all, is not possessed with the necessary property right in the health care resource to enable her to merely appropriate the provider's resources on behalf of the enrollee, in spite of the practitioner's obligations to the enrollee. In other words, if the enrollee's medical needs required medical skill and care commensurate with the recognized standard of care, the physician is duty bound to exercise such skill and care. However, if the enrollee's medical needs require access to available physical and medical resources which in the particular enrollee's case, have not and will not be paid for, then the physician is not only not obligated but is entitled to appropriate those resources for the enrollee. This is argued to be appropriate notwithstanding that the use of said resources might be required by the standard of care. Thus, given two identical patients with identical problems but with very different health care payers, identical physician responses might constitute a breach of the duty of due care in the one case, but not in the other. That is, the standard of medical care is bifurcated into two distinct areas, the skill and abilities of the physician, on the one hand, and the physical and medical resources, on the other. While the former remains constant, the latter shifts according to the patient's health insurance. If the patient is covered by a fee-for-service insurance plan, then the medical skill and care that is

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owed the patient will be the same as that owed the enrollee in a capitated HMO. But what is owed the fee-for-service patient concerning medical resources may differ greatly from what is owed the enrollee in a capitated HMO.

A classic illustration of Morreim's position is Wickline v. State of California.<sup>31</sup> In Wickline, the plaintiff brought an action for negligence against her third party payer, California's cooperative, state and federal program of medical assistance to the indigent, namely, Medi-Cal. The plaintiff was diagnosed as suffering from Leriche's Syndrome which, in the patient's case, required surgery to eliminate the obstructions of her distal aorta. The Medi-Cal program requires prospective utilization review of all cases covered. Without prospective utilization review approval, the proposed medical intervention would not be authorized and, therefore, not covered. The plaintiff's physician made the required request for surgery and for ten days of subsequent hospitalization. Said request was approved by Medi-Cal. After successful surgery, the plaintiff encountered problems, prompting her physician to request an eight-day extension of hospitalization. With the physician's explanation for the needed extension, the Medi-Cal medical review consultant allowed only a four-day extension. The plaintiff's physician reluctantly acquiesced and discharged the plaintiff on the fourteenth day. The plaintiff developed further problems and subsequently lost her leg above the knee.

The issues contested in Wickline might well be argued to illustrate Morreim's distinction between the practitioner's covered skill and care on the one hand, and medical resources, on the other. In Wickline, the surgeon's skill was appraised against the national standard of care used to judge all surgeons performing said medical intervention. Yet, it was the plaintiff's health insurance (Medi-Cal) that set the range of medical resources owed the plaintiff at fourteen days. Arguably, fee-for-service health plan might well have set the obligation to the tune of eighteen days. Consequently, the absence of physical resources would excuse the practitioner's failure to employ such resources, as required; so also should the physically available but financially unavailable resources excuse the practitioner's failure to employ such resource, as required.

Morreim's point is that since financial unavailability should be legally and ethically treated like physical unavailability, the duty owed by the health practitioner must be modified by what the health care payer, rightly or wrongly, has made financially available. If Morreim is correct that there obtains a difference between the skill and care a patient may legally expect from her physician on the one hand and the health care coverage she can expect from her health care payer on the other, then the physician's liability for malpractice would only arise when both the payer covered the service and the physician exercised her skill in a substandard fashion. Nevertheless, according to Morreim, the health care practitioner owes the full measure of her skill and care to the patient for those medical services that are covered. Liability against a practitioner is possible, but predicated upon the physical and economic actuality of the medical services themselves.

## III

As managed care organizations, in general, and HMOs in particular, strive to abate the rising cost of health care, the role of practitioner incentives is increasingly valued.

Indeed, as noted above, one prodigiously popular incentive is the possibility of the gatekeeper profit sharing the remaining referral funds. But if such incentives are indeed effective and specialists are not addressing enrollee medical problems, who is?

In an interesting and illustrative case, Chapel v. Allison<sup>32</sup> the plaintiff-patient sought medical care from a general practitioner who treated the plaintiff but who failed to refer the plaintiff to a specialist. When the plaintiff's injury failed to properly heal, he brought suit against the physician. One of the issues confronting the Montana Supreme Court was whether to hold the general practitioner to the standard of care of a general practitioner or to the standard of care of a specialist. The Montana court acknowledged the general, common law rule that a general practitioner who voluntarily assumes the duties of a specialist will be held to the standard of care of the specialist.<sup>33</sup> The Montana Supreme Court, confronted with a general practitioner in a rural area treating a patient suffering from a problem that was permissibly but not exclusively within the domain of the specialist, held the general practitioner to the national standard of care of other rural, general practitioners.

The above noted general, common law rule and the holding of the Montana Supreme Court pose an interesting extension of Morriem's argument. The gatekeeper incentive not to refer to a specialist leaves the gatekeeper to either refer the enrollee to a specialist, perform the required service herself, or do nothing. If the gatekeeper fails to perform the service because of negative utilization review, then according to Morreim, there could be no gatekeeper liability. If the gatekeeper does nothing because of avarice, then the gatekeeper may have been either professionally unethical,<sup>34</sup> committed the intentional tort of inflicting severe emotional distress by acts outrageous and in the extreme, through abandonment<sup>35</sup> and/or negligent in at least not referring the enrollee to a specialist. If, however, the gatekeeper successfully addresses the enrollee's medical problem, then potential legal problems will be circumvented. But if the gatekeeper addresses the enrollee's medical problem and does so in such a fashion as to inspire enrollee litigation, then what standard of care is the gatekeeper to be held, that of the reasonable and prudent general practitioner or that of the reasonable and prudent specialist?

If the gatekeeper is motivated to assume the specialist's duties simply out of economic rapacity, then it would appear that the standard for judging gatekeeper negligence would be set at the specialist level. If held to the specialist's level of due care, the heightened sense of liability might contravene the gatekeeper's economic impetus not to refer to the specialist those enrollees for whom a specialist's attention would be appropriate. The increase in referrals caused thereby might well reduce the economic effectiveness of the HMO. If the gatekeeper, held to the specialist's standard of care, continued to withhold referrals, she might well suffer an increased level of liability, and thereby, potentially reduce the economic efficiency of the HMO. Either way, holding the gatekeeper to the standard of due care of the specialists may well have a negative effect upon HMO economic efficiency.

In order to abate this effect, it might be argued, pace Morriem, that not only what is physically owed a patient may be modified by physical availability and the patient's financial coverage but also that the quality of skilled professional services may be likewise modified by the patient's financial coverage. This relatively unexpected extension of Morriem's important point would render the oddity that with the same general practitioner, the same

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patient, and the same patient problems addressed exactly the same way, might well constitute malpractice in a fee-for-service arrangement and yet non-negligent service in an HMO.

In support, it has been noted that the differing duties owed by the same party to a second party depending on the second party's status is nicely illustrated in the law of torts concerning the duties owed by owners and occupiers of land toward others.<sup>36</sup> Traditionally, the owner or occupier of land owed only a duty not to wantonly or intentionally harm the uninvited party, i.e., the trespasser. The invited social guest, i.e., the licensee, is owed a warning of dangers known by the occupier of land. Finally, the so-called "invitee" enjoys a right to be informed about all known dangers and those dangers discoverable through reasonable diligence.<sup>37</sup> Accordingly, the person who does not enjoy health insurance is not owed any health care coverage and is, therefore, like a trespasser. The enrollee in a managed care organization like an HMO is on par with the licensee while the patient in a fee-for-service plan is like the invitee.

In fact, the same argument might be made about various areas of law. Contract law and legislation are two areas of law where duties owed and rights enjoyed would be dependent upon mutual agreement or governmental proclamation, respectively. The contractual status of one party, for instance, may alter or dictate the contractual duties that a second party suffers to the first. One without a ticket will not be able to see the performance while one with balcony ticket seats will not enjoy the view of the performance enjoyed by one with "front row, center" ticket seats. Legislation may expressly alter duties suffered by various parties to others in terms of recognized status. There are health care statutes that reduce the standard of physician culpability for some practitioner's acts for particular patients. For example, Oregon's Death With Dignity Act<sup>38</sup> shields physicians from tort liability for mistakes about their patient's needs for psychological consultation so long as the mistake was made in good faith.

Nevertheless it might be counted that there is a significant difference between the relevant parties in the three examples, on the one hand and the HMO enrollee, on the other. It could be contended that while the three examples, i.e., tort obligations suffered by occupiers of land, contract obligations, and differing duties suffered by statute, all allow for differences in obligations owed because of party status, the differences are publicly known, and explicit. But in the case of HMO gatekeepers performing procedures generally reserved for specialists, the relevant information is not public knowledge and generally not even known by enrollees. In fact, without fear of embellishment, it might be argued that enrollees believe, based upon presentations about the elimination of "unnecessary fat" and cost benefits of "prophylactic treatment," that they are receiving the same quality, necessary medical care received by patients in a fee-for-service plan. Thus, the problem with the argued analogies is that, unlike the respective parties in the other examples, the HMO enrollee has been given information that would suggest that he will receive the same quality health care as that acquired in a fee-for-service plan. It is not as if the licensee has been told, in ambiguous language, that he will be treated like the invitee. But with phrases like: "medically necessary services" and "quality health care," the HMO enrollee has been told that he will received none of the "fat" but will receive non-negligent care and the same

quality of care as that received by the fee-for-service beneficiary. Arguably, the important difference between the represented parties in the proposed analogical examples and the HMO enrollee is not that the former group has information while the latter has none, but rather that unlike the former group, the latter group has misinformation, cured only through the promulgation of additional true and detailed information.

More important, perhaps, is the dissimilar legal positions enjoyed by the owner of land, on the one hand and the gatekeeper in the HMO, on the other. In the former case, the land belongs to neither the trespasser, the licensee, nor the invitee. The land belongs to the owner and the other parties' status on the owner's land is determined by the owner. In the latter case, while the allocation of the referral fund is determined by the gatekeeper, the referral fund, at least for the express purpose of covering referrals, belongs to the enrollee; not the gatekeeper. In principle, the HMO enrollee enjoys an undivided interest in the whole of the fund. The gatekeeper serves as a trustee of said fund for the benefit of the enrollee. The gatekeeper's acquisition of a proprietary interest in any portion of the referral fund in the face of her fiduciary obligation to the enrollee constitutes a conflict of interest not duplicated in any of the various land-owner relations.

Might the problem be eliminated through an expanded version of informed consent? Might the enrollee simply be informed of and give consent to the HMO's plan to have the gatekeeper engage not only in normal gatekeeping services but also to undertake many medical interventions reserved to specialists and yet be held to the standard of due care of a general practitioner? After all, as in the tort, the contract and legislative examples above, with sufficient information, the enrollee would be cured of mistaken beliefs and be in a position to give full consent.

This suggestion would not be like securing consent from enrollees for gatekeeper negligence or obtaining from enrollees a waiver of gatekeeper liability. The HMO's informing the enrollees that general practitioners will be held to the standard of due care of other reasonable, prudent general practitioners even when said practitioner engages in specialists' activities, would not violate the age old proscription against seeking consent for professional negligence,<sup>39</sup> as what is being consented to is the reduced standard of due care for what constitutes negligence.

It is quite true that inasmuch as the vast plurality of private health insurance is secured through the beneficiary's employer, the information that the HMO gatekeeper will be held to the standard of care of the reasonable, prudent general practitioner rather than that of the specialists when engaged in specialists activities, will be financially important to the purchaser of employee health insurance. It will be of medical importance to the HMO enrollee. Such an informed consent requirement concerning the HMO's gatekeeper liability is in accord with a trend in informed consent cases requiring that more information be disclosed than that of mere diagnosis, proposed intervention with risks, alternatives with risks, and probable prognosis.<sup>40</sup> Disclosure of information deemed relevant but collateral to the general medical information, e.g., economic incentives for practitioners<sup>41</sup> and practitioner variation,<sup>42</sup> has recently been included as information owed to patients. In addition, the disclosure about the appropriate standards of care is information more specific than the amorphous disclosure that the HMO is designed to offer only "efficient," "necessary," "quality" health care. The former description is specific enough to provide for

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both meaningful, informed consent while also legally protecting enrollees from harm due to actual breaches of the general practitioner duty of due care. Non-the less, this information is most important in the decision of what health care payer to choose, a decision usually made by one who will not actually utilize health care, i.e., the employer. The employee-enrollee is generally not a party to this decision notwithstanding that the employee-enrollee is the beneficiary of the decision.

### IV

If the above is not spurious, then as the absence of medical resources may excuse a physician's failure to conform her behavior to the accepted standard, so the financial absence to cover otherwise present medical resources, may either excuse practitioner failure to confer such resources or set the standard of what resources are due. It has been argued that, initial problems notwithstanding, it would follow from the above that given the absence of financial coverage, the skill and quality of practitioner care owed certain consumers of health care may be less than what is owed to other health care consumers who could afford a higher level of skill. It has not been argued that the professional principle, that the same skill and duty owed to one is owed to all accepted as patients, has now become *déclassé*. Rather, it has been maintained only that if physical absence can be argued to alter the professional duty owed to a patient regarding those physical resources and if what is arguably covered by "physical absence" includes both nonexistent resources and existent but financially unavailable resources, then "resources" may also include a physician's skill level of care.

It has also been noted that at least the purchaser and perhaps the consumer of health care might easily be informed, prior to enrollment, that the gatekeeper would be held to the standard of due care of a general practitioner even when assuming specialists' activities. However, neither purchaser nor consumer will find out what constitutes "medical necessity" in the abstract prior to enrollment. They will discover this only after the fact; subsequent to enrollment.

Given the professionally acknowledged difference between general practitioner and specialists; given also that certain medical problems are exclusively within the domain of specialists and with which the general practitioner is not sufficiently skilled to deal, there is a dilemma. If the gatekeeper is held to the standard of care of the specialists, there will be a likely increase in the number of successful malpractice claims with a corresponding decrease in economic efficiency of the HMO. If the gatekeeper is not held to standard of care of the specialists when assuming specialists activities, then the economic efficiency of the HMO, and financial benefits for the gatekeeper will be maintained but at the probable cost of long term increases in enrollee mortality and morbidity rates. The latter horn of the dilemma has been argued to follow from the physical and economic exceptions to the accepted standard of due care. The former horn of the dilemma appears to contravene the cost containment measures of most managed care organizations.

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# ENDNOTES

<sup>1</sup> Barry T. Nace and Larry S. Stewart, "Straight Talk on Medical Malpractice," *The Association of Trial Lawyers of America Report*, 3 (February, 1994). See also, Mark Hall, Ira Ellwood, and Daniel Strouse, *Health Care Law and Ethics*, 2<sup>nd</sup> edition, Chapter 1a, (West Publishing, 1999).

<sup>2</sup> Health Lawyers News Report 3 (1993): Hall et. al., *supra* note 1. See also Lawrence Gostin, "Securing Health or Just Health Care? The Effect of the Health Care System on the Health of America" 39 *Saint Louis University Law Review* (No. 1) 7 (1994). Reprinted in *Contemporary Issues in Bioethics*, 5<sup>th</sup> edition, edited by Tom Beauchamp and Leroy Walters (Wadsworth, 1999).

<sup>3</sup> Charles T. Dougherty, "An Axiology for National Health Insurance," 20 *Law, Medicine and Health Care* 82 (1992); Hall, et. al., *supra* note 1 at b.

<sup>4</sup> Robert Blank, "Rationing Medicine: A Comparative Analysis," 21 *Western State University Law Review* (No. 1), Fall 1993; Gostin, *supra* note 2.

<sup>5</sup> Hall, et. al., *supra* note 1 at b.

<sup>6</sup> Mark A. Rothstein, "Discrimination Based on Genetic Information" 33 *Jurimetrics* 13, 14 (1992).

<sup>7</sup> Id.

<sup>8</sup> Joseph A. Califano, "Rationing Health Care: The Unnecessary Solution," 140 *University of Pennsylvania Law Review*, 1525 (1992); Gostin, *supra* note 2.

<sup>9</sup> Hall, et. al., *supra* note 1.

<sup>10</sup> Eileen P. Flynn, *Issues in Health Care Ethics*, Chapter 17 (Prentice Hall, 2000); Hall, et. al., *supra* note 1.

<sup>11</sup> Id.

<sup>12</sup> Flynn, *supra* note 10.

<sup>13</sup> Edward B. Hirshfield, "Should Ethical and Legal Standards for Physicians be Changed to Accommodate New Models for Rationing and Health Care?" 140 *University of Pennsylvania Law Review* 1809 (1992); Hall, et. al., *supra* note 1; William Sage, Kathleen Hastings, and Robert Berenson, "Enterprise Liability for Medical Malpractice and Health Care Quality Improvement," XX *American Journal of Law and Medicine* (No.s 1 & 2) 1994.

<sup>14</sup> ABA, Special Committee on Medical Professional Liability, "Medical Malpractice: Perceptions and Misperceptions" Endnote 4. American Bar Association, (March, 1993).

<sup>15</sup> *Helling v. Carey*, 519 P.2d. 981 (WA 1974).

<sup>16</sup> Nace and Stewart, *supra* note 1, at 7; Rand Rosenblat, Sylvia Law, and Sara Rosenbaum, *Law and the Health Care System*, Chapter 3a (University Casebook Series, 1997), (Referencing the 1991 Harvard Study).

<sup>17</sup> Daniel Callahan, "Symbols, Rationality and Justice: Rationing Health Care," 18 *American Journal of Law and Medicine* 1 (1992); Marc Rodwin, *Medicine, Money and Morals*, Chapter 1 (Oxford, 1993). See also, Joanne Brant, "Physician Owned Pharmacies: Lawful Business Ventures or Illegal Business Interests" 4 *The Journal of Pharmacy and Law* (No. 1), 1994-1995.

<sup>18</sup> Jean M. Mitchell and Jonathan T. Sunshine, "Consequences of Physicians' Ownership of Health Care Facilities – Joint Ventures in Radiation Therapy," 327 *New England Journal of Medicine* 1497 (1992). Brant, *supra* note 17.

<sup>19</sup> Rosenblat, et. al., *supra* note 16 at Introduction B.

<sup>20</sup> Vickie Y. Brown and Barbara R. Hartung, "Managed Care at the Crossroads: Can Managed Care Organizations Service Governmental Regulations?" 7 *Annals of Health Law* 25 (1998).

<sup>21</sup> Linda Penno, "Managed Care and the Corporate Practice of Medicine" *Trial* 18 (February, 2000).

<sup>22</sup> Barry R. Furrow, Thomas L. Greaney, Sandra H. Johnson, Timothy S. Jost, and Robert L. Schwartz, *Health Law* (Hornbook) Chapter 8 (West Publishing, 1995, 1998). Network HMOs generally allow contracted physicians coverage for services performed for enrollees by non-contracting practitioners and providers. Point of Service plans (POS), like HMOs, employ gatekeepers but like PPOs, allow

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partial financial coverage for services performed for enrollees by non-contracting practitioners and providers. See Christopher Kerns and Carol J. Gerner, *Health Care Liability Desk Book*, Chapter 1 (Clark, Boardman, and Callaghan, 1995). The term "Capitation Payment" was coined by health policy analyst, Paul Ellwood; Hall, et. al., *supra* note 1. See also, Barbara A. Shickich, "Legal Characteristics of the Health Maintenance Organization," in *Health Care Facilities Law*, (Chapter 16) edited by Anne M. Dellinger (Little, Brown, and Co. 1991).

<sup>23</sup> Rodwin, *supra* note 17 at Chapter 5. (Rodwin discusses various HMO incentive plans). See also § 8.03 of the American Medical Association Code of Medical Ethics (1994).

<sup>24</sup> Rodwin, *supra* note 17 at Chapter 5. See also; Berenson, "In a Doctor's Wallet" *New Republic*, 11, 12 (May 18, 1987). Reprinted in Clark C. Havinghurst, *Health Care Law and Policy*, Chapter 10A (Foundation Press, 1988). "Here's how it works. As a private practitioner, I contract with the HMO to provide services to enrollees who select me as their primary care physician gatekeeper." I get a monthly fee, called a 'capitation' (payment by the head), for each HMO enrollee who signs on with me. The capitation payment averages about ten dollars a month, with some variation based on the age and sex of the enrollee. Whether the enrollee comes in once during the year or 20 times, my payment from the HMO remains constant at ten dollars a month for that person. It is all supposed to average out.

Now comes the 'risk' part. For every ten dollars in capitation I receive, the HMO sets aside another \$40 or so in a separate account. This account pays the hospital bills, fees for specialist care, laboratory and X-rays, and other services performed outside of my office. Every time one of the patients on my panel receives a specialty service, my separate account is debited. But I am the one who decides if they need this special attention. As gatekeeper, I must give permission for all non-emergency referrals.

The HMO audits my account annually. If it shows a surplus, I receive a bonus, usually 30 percent to 50 percent of the total surplus in my account. If it shows a deficit, I have to forfeit a portion of my monthly capitations as much as 25-percent. In essence, I am paying for part of every specialty consultation, every hospital day, every ancillary service that the patient receives. The economic incentives are clear: keep the patient away from consultants, out of the hospital, and out of the office.

The rewards are breathtaking. The capitation income of a full-time HMO practice with 1,500 enrollees would total \$180,000 a year, out of which office overhead of perhaps \$80,000 must be paid. A forfeit of 25 percent would result in a loss of \$45,000. But a surplus account could generate a bonus of as much as \$20,000 or \$30,000 or more. Thus, under a typical HMO risk payment system, take-home annual income might vary by \$65,000 or more."

<sup>25</sup> Julia A. Martin and Lisa K. Bjerknes, "The Legal and Ethical Implications of Gag Clauses in Physician Contracts," XXII (No. 4) *American Journal of Law and Medicine* 433 (1996). See also, Furrow, et. al., *supra*, note 27.

<sup>26</sup> Hall, et. al., *supra* note 1.

<sup>27</sup> Penno, *supra* note 21.

<sup>28</sup> See 6-5-484 (AL 1975, 1999). The health care practitioner and provider is each held to the same standard of care that other respective practitioners and providers in the community or neighborhood is held. From the plain language of the statute, it would appear that practitioners and providers are judged by the strict locality rule. But, as the notes clearly show, the word "community" and "neighborhood" are terms of national scope. *Henson v. Mobile Infirmary Ass'n.*, 646 So. 2d 559 (AL 1994) and *Dr.s Lane, Bryant, Eubanks, and Dulaney v. Ottis*, 412 So. 2d 254 (AL 1982).

<sup>29</sup> *Becker v. Janinski*, 15 N.Y.S. 675, at 677 (NY, 1891). See also, Barry Furrow, "The Ethics of Cost Containment: Bureaucratic Medicine and the Doctor as Patient-Advocate," 3 *Notre Dame Journal of Law, Ethics and Public Policy* 187 (1988).

<sup>30</sup> E. Haavi Morreim, *Balancing Act* 88, 116 (Kluwer Academic Publishers, 1991). See also E. Haavi Morreim, "Cost Constraints as a Malpractice Defense" 18 *Hastings Center Report* 5 (February-March, 1988); E. Haavi Morreim, "Redefining Quality by Reassigning Responsibility," XX (No 1 & 2)

*American Journal of Law and Medicine* 79 (1994). *Id.* Morreim's argued position is not clearly distinguished between the enrollee's health insurance determining the duty owed by the practitioner to the enrollee and the enrollee's health insurance serving as an affirmative defense to the argued breach of an independent standard of due care.

<sup>31</sup> *Wickline v. State of California*, 239 (Cal. Rptr. 810 {1986} reviewed dismissed 741 P. 2d 613 (CA 1987).

<sup>32</sup> *Chapel v. Allison*, 785 P.2d 204 (MT 1990).

<sup>33</sup> *Larsen v. Yelle*, 246 NW 2d 841, 845 (MN 1976). "If . . . the general practitioner . . . undertakes to treat when he should refer to a specialist, he will be held to that standard of care required of a specialist."

<sup>34</sup> New physicians take the oath of Hippocrates "to follow that method of treatment which, according to my ability and judgment, I consider for the benefit of my patient, and abstain from whatever is deleterious and mischievous." Reported in Penno, *supra* note 21.

<sup>35</sup> A classic abandonment case is *Rock Hill v. Pollard*, 485 P. 2d 28 (OR 1970).

<sup>36</sup> Bernard Friedland, "Managed Care and the Expanding Scope of Primary Care Physicians' Duties: A Proposal to Redefine Explicitly the Standard of Care," 26 (No. 2) *The Journal of Law, Medicine and Ethics*, 100 (Summer, 1998).

<sup>37</sup> W. Page Keeton, Dan. B. Dobbs, Robert E. Keeton, and David G. Owen, *Prosser and Keeton on Torts* 5<sup>th</sup> edition Chapter 10. (Hornbook) (West Publishing, 1984).

<sup>38</sup> Oregon Rev. Stat. § 127.800 (1995, 1998).

<sup>39</sup> *Tunkl v. Regents of University of California*, 383 P. 2d 441 (CA 1963).

<sup>40</sup> Hall et. al., *supra* note 1 at Chapter 2B. See also, Paul S. Appelbaum, Charles W. Lidz, and Alan Meisel, *Informed Consent: Legal Theory and Clinical Practice*, Part II (Oxford University Press, 1987), Ruth R. Faden, Tom L. Beauchamp, and Nancy M. King, *A History and Theory of Informed Consent*, Parts I and II (Oxford University Press 1986), Robert M. Veatch, "Abandoning Informed Consent," 25 (No. 2) *Hastings Center Report* 6 (March-April, 1995), Edward P. Richards and Katharine C. Rathburn, *Law and the Physician, A Practical Guide*, Chapters 11-14 (Little, Brown and Company 1993). Clifton Perry, "Conflicts of Interests and the Physician's Duty to Inform" 96 (No. 4) *The American Journal of Medicine* 375 (April, 1994). For a surprising note on the power of informed consent with the use of placebos, see Margaret Talbot, "The Placebo Prescription," *The New York Times Magazine* 3 at 39 (January 9, 2000).

<sup>41</sup> See: *Moore v. Regents of University of California*, 793 P.2d 479 (CA 1990) and *Shea v. Esenten*, 107 F. 3d 625 (8<sup>th</sup> 1997).

<sup>42</sup> See: *Johnson v. Kokemoor*, 545 NW 2d 495 (WI 1996).

## DIEHARD: THE LEGACY OF THE TUSKEGEE SYPHILIS STUDY

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From 1932 to 1972, the Public Health Service conducted a study of over 400 African American men with untreated syphilis in Macon County, Alabama at the John Andrews Hospital on the campus of Tuskegee University.<sup>1</sup> This study, better known as the Tuskegee Syphilis Study, was neither the only example in American history of the mistreatment of research subjects, nor the largest nor the most destructive to its participants. Why, then, does the Study's notoriety continue to loom so large in the contemporary psyche nearly 30 years after its public exposure and despite a presidential apology on behalf of the nation to the survivors and their families? In this paper, I will review the major factors that account for the Study's continued notoriety and suggest why it will remain central to bioethical discussions regarding the use of human subjects in medical research.

Two interrelated theses inform my answer to the question posed above. First, though the Study has to be understood in the context of race relations, its significance transcends race. Specifically, the relation of the participants to the physician researchers and Public Health Service has become an icon of the relation of vulnerable individuals to large bureaucratic institutions that support medical research. These institutions often have agendas that overshadow or conflict with the individuals they ostensibly serve. Second, forces that were operative during the period of the Study persist both in American race relations and in the relation of individuals to the medical research bureaucracy. As long as these forces persist, the potential remains for similar abuses to recur. Once we identify with the participants, they become, like canaries in a mine, warnings of a danger threatening everyone. By ignoring the plight of the most vulnerable members of society, we ignore our own peril.

The Study's persistent notoriety first has to be seen within the legacy of exploitation of African Americans at the hands of medical researchers, especially in the South.<sup>2</sup> As Vanessa Gamble has argued, this legacy underlies the continued fear and mistrust that African Americans have toward the medical profession.<sup>3</sup> The Study was especially disillusioning in being sanctioned by the federal government, in which the African American community had hitherto put more trust than in state governments. This disillusionment, along with persistent, widespread disparities in access to health care,<sup>4</sup> reinforces the belief that the government is indifferent, if not hostile, to African Americans. When opinions are canvassed regarding their mistrust of health officials and

medical practitioners, African Americans frequently mention the Study as shorthand for all that is wrong with their relation to the health system. Likewise, it has become shorthand for explaining their resistance to attempts to control AIDS in their community.<sup>5</sup> Typically, the core of this negative icon of their relation consists in the belief that researchers deliberately inoculated the men with syphilis. This erroneous belief persists even amongst educated African Americans and is widespread throughout the American public. This belief indicates ignorance of the facts. In brief, the men were not treated for the syphilis with which the physician researchers diagnosed them; they were never told they had syphilis; to ensure their participation in the Study, they were led to believe they were being treated for "bad blood," a vague term they themselves used to describe various chronic ailments. This error also underscores an icon's inadequacy to the complicated nexus of issues the Study raises. Nevertheless, the error illuminates how African Americans typically fill in the gap in their understanding of this nexus, namely by situating it within the context of their exploitation. Specifically, genocide is often seen as the underlying intention behind the Study as well as efforts to control AIDS. Seen in this context, it at least makes sense why so many African Americans believe the men were inoculated with syphilis. Trying to correct these erroneous belief with mere words will not suffice as long as mistrust prevails and health-care disparities persist. Until these issues are resolved, the Study will continue to negatively symbolize the relation of African Americans to medical research and to the health care system.

Unresolved issues and controversies are a second major factor keeping the Study in the forefront of attention. The story of the Study is one rich in moral ironies and ambiguities as well as moral outrage, of good intentions gone wrong, and of chickens coming home to roost. Despite the presidential apology and admission of blame on the government's part, the question of individual blame has never been resolved. The class-action lawsuit the participants filed against the government was settled out of court; the blue-ribbon HEW Advisory Panel commissioned to issue a final report on the Study never prosecuted individuals. Yet questions of individual blame abound. What officials were ultimately responsible and what were their real motives and rationale? To what extent, if any, did the research ends justify the means used in the Study? Were the African American health care professionals who helped conduct the Study victims themselves or perpetrators? Why has a disproportionate share of blame and attention been focused on Eunice Rivers, the indispensable liaison nurse between the doctors and the men? What was Tuskegee University's role in hosting the Study? Apologists for the Study have cited different standards of race relations, doctor-patient relations and views on informed consent in research to justify the Study. Do historically relative standards exonerate individuals? Given that most of the men received minimal treatment to render them non-contagious and some probably received additional treatment, did the Study have any scientific value as a study of *untreated* syphilis? Assuming that the study did have scientific value, was it moral to use its results given the immoral basis on which the results were predicated? Finally, what for many is the decisive question: why were the men never treated with penicillin when it became readily available?

A medical case could be made for non-treatment, both at the outset of the Study and after the discovery of penicillin.<sup>6</sup> At the time of the Study's inception in 1932, the only prior study of untreated syphilis, the so-called Oslo study, had suggested that non-treated

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syphilitics had lower rates of morbidity than those who received the standard arsphenamine treatment, which compromised the immune system. Methodological problems with the Oslo study as well as questions whether its results were applicable to African Americans provided rationales for a new study of untreated syphilis. Furthermore, although arsphenamine treatment had improved between the Oslo study and 1932, it was time-consuming, unpleasant, and cost-prohibitive for the Public Health Service during the Depression. By the time penicillin became a standard treatment for early syphilis in the 1940's, most of the Study's participants had late stage syphilis. The evidence from several studies conducted around the same time suggested that penicillin was not indicated as a treatment for late-stage syphilis. To this day, it remains unclear whether penicillin can effectively treat late-stage syphilis.

Though such a case can be made, it must be remembered that the Study produced not doctor/patient relations but physician-researcher/patient-subject relations that were further complicated by the men's ignorance of the true nature of this relation. Given the mixed roles of the physician researchers and their need to conceal one of these roles, it becomes problematic to assess the motivation for their decisions in relation to then-current medical standards for treatment. Did they withhold treatment of penicillin because it was being withheld elsewhere or because they did not wish to compromise the results of the Study? Why did they believe that the results of studying untreated syphilis were more important than investigating rigorously the effect of penicillin on late-stage syphilis? Many more questions could be raised about the sort of cost-benefit calculus that went on in the minds of the physician researchers. All of them, however, implicate the cardinal point that all of these calculations occurred without any input from the men whose health hung in the balance. In the end, focus on the health consequences of treatment versus non-treatment has obscured the more serious and prior issue of the moral injury done to the men.

The controversies surrounding the issue of treatment should not be allowed to obscure the wrong done in misleading the participants into believing they were involved in a course of treatment for "bad blood." Most of the men, who were poor sharecroppers, probably would not have considered it worthwhile to participate in a research study, nor would their sharecropper bosses have supported it. The doctors and officials who set up the Study were probably right in believing that lying was necessary get participation. Yet they also believed that the Study would yield valuable medical knowledge. Initially, they also believed their activities would generate publicity about the magnitude of the syphilis problem amongst the African American inhabitants of the rural South and that this publicity would help to generate the resources necessary eventually to treat the men. In short, they thought that the end results of their research efforts justified the expedient of lying. Although all the participants were African Americans, nothing indicates that the Study ever was racist in the sense of an intentional hate crime. Marked differences in race, class and/or education, however, prevailed between the Study's administrators and participants. These differences caused a lack of empathy that played a decisive role in the failure to consider the participants fundamentally as peers in regard to their humanity. This failure, which amounted to disrespect, led to the violation of the participants' autonomy. Specifically, they were neither informed of the real nature of the Study, nor was their consent sought to become research subjects. This expediency of lying set the survivors up for disillusionment with the government and a major loss of dignity within their own

community. In the wake of the public exposure of the truth in 1972, what seemed at the time to be just a little white lie became a momentously damaging white man's lie to Black America.

A third major factor in explaining the Study's notoriety concerns the shock given to the American psyche by the public exposure of the Study. The explosive, moral outrage that followed exposure radically contrasted with the low-profile gradualism which characterized the Study's 40-year course. It had gone from being a provisional, one-year study done in lieu of eventual treatment to one that saw men through to autopsy. While its researchers published articles on it in medical journals, it went unnoticed by the general public. Prior to its exposure, hardly anyone who knew of its existence had any objection to it. Yet when the story broke, the response was sudden, vehement and ongoing.

To understand this rapid reversal, one has to consider the participants against the backdrop of changes in America that took place during the Study. The participants were throwbacks to an earlier period in American history. Macon County, Alabama was one of the poorest counties in one of the poorest States. The men were poor, black sharecroppers, largely uneducated, living in shanty houses without running water or sewage systems. Most had never been to a doctor or medical facility. They were beholden to the white landowners both for the right to work tenant farms and for the necessities they were obliged to buy on credit from the company store. As often happened, they fell into debt to the company store, and sometimes forcibly were prevented from leaving their condition while in debt. Though neither slaves nor serfs, they had made amazingly little progress since Reconstruction. Meanwhile, during the course of the Study, America came out of the Great Depression and World War II to transform itself from a rural, farming nation to an urban, industrial nation. Perhaps most significantly, by the end of the Study, America had undergone the black civil rights movement and a patient's movement critical of the practice of the medical profession. The exposure, then, erupted in an atmosphere much more sensitive to issue of individual rights and encroachments upon them by higher powers. When it did, it seemed that the participants had stepped out of a time-warp into the present. America caught a shocking glimpse of conditions that prevailed in the rural South well before the era of Civil Rights. For African Americans, it was like the recurrence of a nightmare that washed away a decade of hard-won gains. The involvement of the federal government also raised specters of a massive bureaucratic machine indifferent to individuals in pursuit of its own mandates.

The shocking discrepancy between America's self-image and the mirror image of itself refracted through this time-warp created a wound in the American psyche. It first sought to heal this wound quickly through Senate hearings, through new HEW guidelines for research involving human subjects and finally through the National Research Act of 1974, which mandated institutional review boards (IRB's) at institutions receiving federal funding. These IRB's constitute a fourth factor in explaining the vitality of the Study's legacy. In a sense, every research proposal that comes before an IRB represents a collective reminder to ourselves to prevent a similar outrage from occurring.

The wound, however, went deeper than could be healed legislatively; it has prompted writers and researchers to dig deeper to understand the Study. Several plays have been written, an HBO movie, *Miss Ever's Boys*, aired, myriad articles have been published in scholarly journals and three books have appeared on the Study. The process

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of assessment and of self-reassessment has been ongoing ever since the Study was exposed. That it continually provides ground for new insights and revisions of its meaning constitutes a fifth major factor in the enduring character of its legacy. The Study appears to be an endlessly fertile ground for new insights and revisions into its meaning, but also a crossroad at which two opposing trends will collide, namely, the medical-scientific and the historiographic-hermeneutic.

The former is represented by Robert M. White, MD, who has attempted to vindicate the Study's physician researchers, while criticizing the methods and conclusions of "historiographers."<sup>7</sup> White sees the unwillingness of African Americans to participate in clinical trials and AIDS testing as the result of misleading attempts to use the Study to validate mistrust of the government and give credence to conspiracy theories directed against African Americans. He provides an empirically based analysis of the medical facts underlying the decisions on which the doctors who conducted the Study based their decisions. He suggests that the medical risk of the Study to the men did not outweigh the research benefits, while he addresses the question of informed consent by indicating that this concept was not AMA policy until 1946. Furthermore, he demonstrates convincingly that the decision to withhold penicillin treatment for the aged participants was *consistent* with medical practices current at the time in question. He accepts the charges by historiographers of the Study that researchers lied to and deceived the men to gain their cooperation. However, his main response to this fact was that this deception was not evident in the articles published by researchers involved in the Study and therefore not available to journal editors, peer reviewers or those who read the journals. Instead of addressing the substance of these charges, he casts doubt on the motives and methodological rigor of the historiographers who made them. White's position is that the facts of the case will speak for themselves and vindicate the physician researchers in the Study. The implication of his article is that medical researchers base their decisions on facts, while historiographers create myths based on biases.

The historiographic-hermeneutic position is represented by Susan Reverby, editor of the most recent book on the Study.<sup>8</sup> She is aware that although facts may speak for themselves, the interpretative framework through which we hear them co-determine the story which they tell us. She also recognizes the great diversity of interpretations that different people have seen or read into the Study. She sees not only this diversity, but also the changing character and revisions of interpretations, as a process of enrichment and deepening of our understanding.

The debate between these two trends, which has only begun, has occurred appropriately in regard to the Study for two reasons. First, medicine is a field that bridges the divide between the humanistic and scientific disciplines. Second, scientific research on human subjects pushes to the limits our traditional conception of scientific neutrality and objectivity. Doctors today are largely trained in scientific procedures; patients tend to be reduced to bearers of pathological conditions amenable to such procedures. Such an approach may be unproblematic in regard to investigations of nature, where the quantification of results shows the least variation to interpretative biases due to the universal characteristics of mathematics. However, scientific methodology becomes increasingly problematic and subject to interpretative variation as one moves into the humanistic disciplines. Although resistance to these efforts have existed since the inception

of modern science, the tendency has been to reduce the phenomena in question to that which is amenable to such procedures or to ignore them. Appropriately, the human subject has dug in its heels here at the point where human 'subjects' in medical research have become mere objects.

At the outset, I indicated that the Study will continue to loom large in the American psyche as long as the conditions that gave rise to it persist. That continues to be the case with respect to race. As I have also suggested, the Study's significance transcends race even as race serves as an icon of the modern individual's relation to large-scale bureaucracy. The participants stand before the bureaucratic establishment of public health in a way reminiscent of Kafka's figure of K in the *Castle*: small, vulnerable and innocent before an inscrutable, imposing power. Ironically, those same marked differences between the researchers and the participants which caused a lack of empathy can also serve as the basis of identification with the participants. All of us have felt similarly vulnerable in the face of the huge, impersonal bureaucracies which dominate modern life. The helplessness and fear we feel in the face of bureaucracy results from what I would term the banality of the good; namely, a bureaucracy's mandate to perform some social good. The danger lurking in this banality is not an evil intention, but a good intention carried out indifferently with respect to individuals. This social mandate from on high, as it were, easily leads to abuses of power. It gives bureaucratic administrators a moral carte blanche, as it were, to effect that good with the frequent result that some social end justifies whatever means are used against individuals.

The foregoing considerations suggest how the good intentions of the physician researches of the Study could have resulted in acts that injured individuals. Yet similar constellation of factors exist today with respect to medical research on human subjects. Usually, the researcher is employed by a large institution, his research usually involves some good to human life, and his relation to the research subject is impersonal and non-reciprocal. The researcher seldom interacts with human subject as an equal. Often, the researcher stands higher in class and economic status than the subject. Invariably, as an expert in his field, he is superior with respect to knowledge of the research topic and procedures. The situation becomes even more frightening when extra-bureaucratic personal motives influence the actions of an administrator, yet are concealed beneath the umbrella of the mandated social good.

A case in point is the death in 1999 of Jesse Gelsinger, an 18-year-old participant in an experimental gene therapy trial at the University of Pennsylvania Medical Center. To gain his family's consent, researchers overestimated the possible advantages of participation while deceiving him as to its dangers. Moreover, the procedure violated the protocols of the institution's IRB. In addition, researchers had financial stakes in biotech firms that stood to gain from the results of the research. In the wake of his death, the NIH issued a new set of guidelines, the Department of Health and Human Services sponsored a conference on Human Subjects Protection and Financial Conflicts of Interest, Congress held hearings on the issue and a House bill on Subjects Protection was introduced.<sup>9</sup>

With the mapping of the human genome completed, medical research is poised to investigate how the genome actually functions within the cellular metabolism. This knowledge promises to hold the key to the cure of various diseases and genetic defects as well as to genetically re-engineer human progeny. Researches are eager to be credited

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with being the discoverer of these cures or these breakthroughs. Pharmaceutical and biotech companies stand to make fortunes on the applications of this knowledge. Such pressures will create an enormous demand for human subjects in research with correspondingly enormous potential for widespread abuse.

Like a foreboding cloud, the Study looms over the horizon of these bright prospects of medical research much as Three Mile Island looms over the prospect of building more nuclear power plants. Perhaps not by accident, this negative iconic role of the Study has come under assault by medical researchers at a time when there will be increasing demand for human research subjects. Medical research today holds great promise and should proceed on course. One can only hope that in the rush to make discoveries, researches will not forget the lessons of the Study.

### ENDNOTES

<sup>1</sup> To the best of my knowledge, three books have been published so far on the Tuskegee Syphilis Study (hereafter: the Study). They are listed below. Unless otherwise noted, the information found in this article is based on material found in these works.

Jones, James H. *Bad Blood: The Tuskegee Syphilis Experiment*. New York, NY. The Free Press. 1993. This work has become the standard historical account of the Study.

Gray, Fred. *The Tuskegee Syphilis Study*. Black Belt Press. 1998.

This work, in large part based on the previous work, retells the story from the perspective of the author, the lawyer who represented the survivors in their class-action lawsuit against the government.

Reverby, Susan M. ed. *Tuskegee's Truths: Rethinking the Tuskegee Syphilis Study*. Chapel Hill, N.C. The University of North Carolina Press. 2000.

This work offers a collection of documents and essential articles that have been written on the Study from a wide variety of interests and perspectives.

<sup>2</sup> Todd L. Savitt, "The Use of Blacks for Medical Experimentation in the Old South," *Journal of Southern History*, 48, 1982: 331-348.

<sup>3</sup> See Vanessa Northington Gamble, "Under the Shadow of Tuskegee: African American and Health Care." In: Reverby, Susan M. ed. *Tuskegee's Truths: Rethinking the Tuskegee Syphilis Study*. Chapel Hill, N.C. The University of North Carolina Press. 2000: 431-442. See especially footnote #4, p. 440 for bibliographic references to further articles on mistrust of the medical establishment amongst minorities.

<sup>4</sup> For a recent collection of articles on disparities in health care, see Leslie A. Melzer and Jason Silvers, eds., "Symposium Issue: Current Racial and Ethnic Disparities in Health," *Yale Journal of Health Policy, Law, and Ethics*, Volume 1, Spring 2000.

<sup>5</sup> See the final chapter, "AIDS: Is it Genocide?" in Jones, *Bad Blood*.

<sup>6</sup> See Robert M. White, "Unraveling the Tuskegee Study of Untreated Syphilis," *Archive of Internal Medicine*, 160: 585-598.

<sup>7</sup> Ibid.

<sup>8</sup> Reverby, *Tuskegee's Truths: Rethinking the Tuskegee Syphilis Study*.

<sup>9</sup> See Märgot Iverson and Sheryl L. Wallin, "Conflicts of Interest in Human Subjects Research," *Ethics, Law and Public Policy*, Volume XIII, Number 3, Summer 2000.

## WHAT CAN GENETIC ENGINEERING ACCOMPLISH?

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### ABSTRACT

Many arguments critical of genetic engineering presuppose that it is capable of creating individuals of a specified type or with particular qualities. Recent investigations of neural development yield data which reveal that there are good reasons to believe this assumption is false. These studies have produced a significant body of research showing that experience and environment following birth powerfully shape the brain's structure and the ways it functions. This result implies that the genetically identical brains of two different individuals will likely develop in markedly different ways, and thus that they will have different abilities and personal qualities. In addition, research shows that individual character and values are closely linked with neural development and are also molded by early experience. Finally, there are a number of reasons to believe that attempts to control an individual's environment in an attempt to nurture desired characteristics will fail. These conclusions do not imply that genetic engineering is necessarily benign or innocuous; they imply only that certain arguments commonly directed against it are misconceived.

### INTRODUCTION

Powerful technology inspires both hope and fear. Genetic engineering promises to be powerful indeed. But, before we can decide how much to hope for or fear from genetic engineering, we must try to understand how powerful it is likely to be. A portion of the hope and fear genetic engineering inspires is prompted by the belief that it is capable of creating specific types of individual human beings, super human beings perhaps, or semi-human drones, or human beings custom designed for certain tasks, such as lengthy space travel or labor in hazardous environments. A related concern is that genetic engineering can produce individuals with certain notable qualities, such as Albert Einstein's intellectual brilliance, Bo Jackson's athletic prowess, or Bill Clinton's political agility (Caplan, 2000, pp. 219-221 and Talbot, 2001).

Much of the controversy genetic engineering inspires depends on this crucial assumption, that is, the belief that genetic engineering will enable us to create individual human beings who possess particular, specifiable qualities or an array of particular, specifiable qualities. This presumption is false. It is unlikely that another individual genetically identical

to Bo Jackson would display his astonishing array of athletic skills, and it is even less likely that another individual genetically identical to Albert Einstein would have a career even remotely similar to his.

Genes matter, of course. They matter a great deal. But, genes alone do not determine what qualities we will possess, what abilities we will enjoy, or what attitudes we will exhibit. Genes, for all their interest and importance, are not destiny. They are simply the initial plan for the individual. In addition to our genes, the sorts of people we become, the talents we possess, and the behavior we display are powerfully shaped by an enormous array of factors, still imperfectly understood, which can be collected under the headings of 'environment' or 'experience.'

If human individuals were produced in rote mechanical fashion, like refrigerators on an assembly line, then the initial blue prints would fix the individual's nature and qualities. The way in which humans develop is far closer to the process by which a talented craftsman produces a violin. A master worker will always begin with a plan, but will never follow the initial plan blindly. The skilled artisan will make many small and large adjustments along the way to the finished instrument to allow for differences in the materials used, the temperature or humidity of the shop, the type of varnish used, or the tone desired (Arakélian, 1981 and Wake, 1970)<sup>1</sup>. As a result, no two violins will be exactly alike, even when they follow the same initial plan, and, sadly, journeymen workers will never produce instruments with the sound of a Stradivarius, even when they follow the master's plans carefully. For many of the same reasons, two genetically identical individuals will develop in different ways. Though individuals may not be hand crafted by a skilled master, environment and experience alter and tune the organism in much the way an artisan might.

Reflection on the development of the human brain, and, more broadly, intellectual abilities, illustrates the point. To focus thinking, consider a clone of Albert Einstein, assuming intact DNA could be found in his preserved tissue then employed to make a genetic duplicate. Is it likely that this individual would come to have Einstein's intellectual abilities or repeat his astonishing achievements?

## NEURAL DEVELOPMENT

At present, we are years away from fully understanding which arrays of genes influence the creation of neurons, transport them to various areas of the brain, create the myelin sheaths that insulate axons and control the speed of neural transmission, and oversee construction of the scaffolding of glia tissue that supports and molds neural material. That is, we are far from understanding the array of processes that control the creation and development of the human brain. Nonetheless, it is increasingly clear that genes account for only a portion of an individual's intellectual abilities. Unambiguous data reveals that average IQ increased at a rate of 3 points per decade in the twentieth century (Neisser, 1998)<sup>2</sup>. Because 100 years is a vanishingly small stretch in biological terms, the advance cannot be accounted for by genetic alteration. It can most plausibly be accounted for by environmental changes.

Researchers are only beginning to comprehend the relationship between environmental factors and intellectual abilities. Nonetheless, it has become clear that the nature of our brains and the sorts of people we become are powerfully shaped by a chain of experiences and environmental stimuli that stretch back to fetal development in the womb. For example, if certain regions of the developing human organism's brain are exposed to testosterone during the third trimester of development, its pattern of hormone release will subsequently resemble that of post pubescent males, and this chemistry cannot be altered by subsequent intervention (Shonkoff and Phillips, 2000, p. 195)<sup>3</sup>.

The brain develops and reconfigures at a furious rate after birth, and it continues to evolve through adolescence. Several decades of research have demonstrated that the array of synapses, that is, the connections between neurons or the brain's wiring, changes dramatically in the course of early development. The brains of newborn infants spin out synaptic connections at a dizzying pace. However, vast numbers of these connections are subsequently deleted (Shonkoff and Phillips, 2000, pp. 186-90). Controlling centers of the brain shed synapses at varying points in the individual's development. Synapses in the neural networks which control sight and hearing begin a spasm of explosive growth about a month before birth, reach their greatest number at birth, are pruned during the first years after birth, and remain stable thereafter. These networks are largely complete by the end of the third or fourth year. Synaptic connections in the domains of the brain controlling speech reach their maximum at around 7 months after birth. Then the pruning and refinement begins. The networks controlling speech are largely complete by the fifth year of life. In contrast, the synaptic networks controlling higher cognitive functions do not attain maximum growth until the second year of life, then the process of deletion and fine-tuning begins; the networks attain their mature configuration in the fifteenth or sixteenth year of life. The twin motors of experience and environment drive these processes of deleting and fine-tuning neural wiring. The pruning is also controlled by the individual's activities. Idle neural connections are weeded out, while those needed for the individual's activities are retained and adjusted for optimal performance. Neural function is also regulated by the growth of the myelin sheaths which swath axons. These coverings serve as insulation, much as plastic coatings insulate electrical wires, but they also influence the speed at which neural networks operate. Hence, the individual's experiences and activities determine not only how each sector of the brain is wired but also how quickly it performs particular tasks.

Scientists have long recognized that the brain loses neurons during the course of life. They have also believed that mature individuals cannot manufacture additional neurons. This view has proven mistaken. Recently, investigators have discovered that individuals routinely generate new neurons and that this process of generation continues throughout life. Neurons are created to accommodate new memories, acquired skills, and novel activities (Shonkoff and Phillips, 2000, pp. 1990-1).

Obviously, no individual has the same experiences as any other, and that implies that no two brains will be wired in the same way, not even two genetically identical brains. Each individual's wiring pattern will be unique, even those of two genetically identical individuals reared in the same general environment. Neither will two individuals, including two

genetically identical individuals, have precisely the same arrays of neurons, since these are also controlled by experience and environment. Furthermore, an Einstein clone will live in a vastly different world than the original Albert Einstein. Anyone born into the contemporary industrialized world is well advised to gain an early and intimate acquaintance with computers, and will quickly develop the neural structures and motor skills needed to cope with and exploit them. An Einstein clone will, for better or worse, likely grow up immersed in video games and substantial doses of popular music. He will quite probably will have to make his way in a contemporary urban environment, with its stimuli, pleasures, temptations, and assaults on psychic equilibrium. Neither the young Einstein nor the elderly coped with similar influences. But experiences like those above will shape the clone's brain, activities, and interests in ways that will be vastly different than the influences which guided young Einstein's development.

In sum, contemporary research shows that the brain does not remain stable after birth. It is continually changing and restructuring in response to experience, environment, and activity. Thus, an Albert Einstein clone would simply not have the same brain as the original. The new Einstein's brain would be wired differently, function differently, and possess different arrays of neurons.

#### CHARACTER TRAITS AND VALUES

Individual achievement depends on more than native intellectual endowment. Character and interests also drive it. Even if by remote chance an Einstein clone somehow inherited a brain that was structurally, as well as genetically, similar to the original Einstein, it would remain unlikely that the new individual's course of life would resemble Einstein's. It has recently become fashionable to tout the importance of emotional intelligence, generally understood as the ability to empathize with others, manage one's own emotions, and maintain a positive attitude (Fisher, 1998 and Goleman, 1995). Emotional intelligence appears to amount to old-fashioned maturity, cooperativeness, self-discipline and even disposition. Whether new fangled or traditional, such qualities of character are readily acknowledged to be vitally important for those seeking successful careers. Contemporary research demonstrates that the individual's ability to control emotions, organize behavior, and focus attention develops at an early age, and is shaped by culture, interaction with parents, and experience. Further, this emotional development is closely linked with neural development, so differences in brain structure will influence emotional expression and control. Experts emphasize that individuals have different temperaments and that temperament has a biological foundation, but they insist that the infant's environment shapes its innate dispositions to accord with social practice and parental disposition (Shonkoff and Phillips, 2000, pp. 93-123).

Of course, achievement and distinction also depend critically on the individual's interests and values. It is highly unlikely that a contemporary Einstein clone would be exposed to the influences that propelled the original Einstein into a career of unparalleled accomplishment. It is difficult to know what experiences drove Einstein to his pursuits, and it is difficult to know whether a similar array of experiences could have driven a less gifted individual to similar heights. A contemporary Einstein clone is far more likely to be exposed to influences which would direct him into a career in computer engineering, software programming, or . . . genetic engineering . . . than physics. And, of course, physics has

vastly changed from the physics that Einstein learned. Relativity no longer awaits discovery, and Newtonian mechanics no longer awaits its overthrow. Contemporary physics, and the problems it addresses, are vastly different from those that engrossed Einstein—and vastly different intellectual skills and interests are required to solve them. Hence, the irony is that it is entirely possible a faithfully recreated Einstein, with his abilities, drives, and skills would not prosper in the environment of contemporary physics.

### ENVIRONMENTAL MANIPULATION

At this point alert readers are likely considering an extremely important issue. The obvious way to create a second Albert Einstein would be to begin with Einstein's genetic duplicate, then rigorously control the clone's environment in ways which will prompt his brain and character to develop in exactly the ways the original's did. There are five important practical problems and an array of moral difficulties with this gambit. First, we don't have anything near the vast array of detailed and precise knowledge of Einstein's early environment and experiences that would allow the generation of another precisely like him. The world of Einstein's youth is lost to us forever. Second, researchers presently understand only the sorts of environmental factors that impede normal intellectual and emotional development. Despite occasional lurid reports in the mass media, they don't know how to construct environments that will enhance intellectual development or nurture extraordinary intellectual gifts (Shonkoff and Phillips, 2000, pp. 194-6).

Of course, it seems reasonable to presume that at some point in the future science will have the expertise, and human societies will have the means and political will, to so tightly control the environment of each individual that we will be able to conjure up individuals with particular abilities and particular arrays of behavior and temperament. However, this effort would require enormous resources and an unprecedented degree of intrusion into the lives of individuals and their families, and it's unlikely that even an extraordinarily ambitious effort could completely erase the impact of chance events or be tuned so precisely that it could detect all conceivable factors that shape a youngster's development.

But the third practical difficulty blocks the way to implementing the above scheme: Every moment of the individual's life and every detail of his environment would have to be rigidly controlled—and this intrusive control would be fully apparent to the individual and all in his vicinity. By definition young Einstein's environment was not thus rigidly manipulated. As are most childhoods, it was filled with spontaneity, accident, and roaming curiosity. It was also heavily freighted with an abysmal educational system that bored young Einstein to distraction (Brian, 1996, pp. 3-4). Who knows how much of his uncanny insight into the fundamental nature of things was facilitated by endless stretches of daydreaming in relentlessly dull classrooms? A genetic duplicate in the hands of adults eager to mold him into a second Einstein via a rigidly controlled environment would likely never experience genuine spontaneity or accident and would likely never be subjected to many years of grindingly dull education. And, people who emerge from tightly controlled environments become different persons than those who do not.

A fourth practical problem is that researchers have shown that many types of environmental influence are not permanent (Shonkoff and Phillips, 2000, pp. 196-8). That is,

changes brought by the environment commonly erode once the individual is removed from it. Hence, a thoroughgoing attempt to create individuals of a particular sort could not halt once individuals emerged from infancy. The intrusion would have to continue at least through young adulthood and likely for the duration of the individual's life, if the programmed effects were not to be lost.

The final practical difficulty is that researchers would have to address the question of whether it is reasonable or desirable to attempt to recreate the world of Einstein's youth at the present time. Recall that people presently coming of age need an array of skills, influences, and experiences that the original Einstein would never have encountered and would never have needed. A faithfully recreated Einstein would lack skills and experiences that are essential for coping with contemporary life and science, and thus would be handicapped from the beginning rather than emerging into adulthood with significant advantages over his peers.

The above discussion also opens the way to another set of formidable difficulties. If the means and will came available to faithfully recreate the environment and influences which shaped the young Einstein, the effort would bring in its train an array of *moral* difficulties which far surpass those associated with genetic engineering, for they would require far greater control over individuals than human societies are currently willing to allow. There would be obvious breaches of the rights to privacy, freedom of association, freedom of speech, and freedom of religion that have pride of place in the U.S. Constitution, the United Nations' Universal Declaration of Human Rights, and the lion's share of the world's other codes of human rights. Further, the individual subjected to this regimen would clearly be viewed only as a vehicle for the reconstruction of a second Albert Einstein. It would be obvious that this person would not be viewed by his managers as a unique individual who should be valued for his own sake and whose interests and values were deserving of respect. He would be, instead, the instrument others would use to fulfill their own desires.

## CONCLUSION

None of the above implies that programs of genetic engineering (even those not supplemented by ambitious and elaborate efforts at environmental manipulation) are innocuous or inevitably benign. It remains a highly powerful technology and will likely reshape human life in profound and as yet unimagined ways. Genetic manipulation is able to prevent damage from genetically linked diseases and will likely have some limited ability to endow individuals with certain desirable physical traits, emotional dispositions, and intellectual qualities. Of course, genetic manipulation could also be employed to harm individuals by deleting important genes or introducing genes that produce undesirable traits. Hence, present discussions do not address the question of whether genetic manipulation is desirable or morally innocuous.

This essay's goal is quite limited. It has sought to show only that certain arguments are misguided, those purporting to find grave moral faults with genetic engineering which issue from its supposed ability to create individuals of particular specifiable types or to create individuals with arrays of significant personal, intellectual, or athletic qualities. These sorts of criticisms are misguided because genetic manipulation simply cannot achieve such results. Further, it is most unlikely that genetic manipulation supplemented by extraordinarily

ambitious and cumbersome manipulation of the individual's environment and experiences will be able to achieve these results either.

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#### ENDNOTES

Arakélian and Wake have lengthy discussions of the myriad subtle factors luthiers weigh when constructing a violin. Both emphasize the importance of balancing woods of different thickness and density, proper shaping and carving, choosing techniques for joining pieces, seasoning the instrument, making and applying varnishes, and final finishing. The skilled luthier must consider all these factors, as well as those of humidity, temperature, and the desired tone, at each stage of construction in order to produce an extraordinary instrument rather than a mediocrity.

<sup>2</sup>Neisser's anthology holds a series of articles which discuss the 'Flynn Effect,' the steady increase in IQ during the last century discovered by the New Zealand researcher James R. Flynn in the early 1980s. Though Flynn believes that the increase is too large to be genuine, the consensus of other researchers is that it is not a fluke. A wealth of explanations has been proposed to account for the effect. These include: increased schooling, better nutrition, smaller families, urbanization, and cultural evolution. All agree, nonetheless, that a change of this magnitude in the space of a few generations could not be caused by genetic evolution.

<sup>3</sup>This essay relies heavily on Shonkoff and Phillips' work, a report issued by the National Academy of Sciences. It contains no original research, but is a digest of the results of a vast array of research on early childhood development. Their list of sources runs to 117 pages. Its discussions of neural development are both detailed and comprehensive and draw on a large body of recent investigation.

## BOOK REVIEW

### SCIENCE AND CULTURE INTERFACING: THE HUMAN GENOME PROJECT

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Controlling Our Destinies - Historical, Philosophical, Ethical, and Theological Perspectives on the Human Genome Project, Phillip R. Sloan, ed. 535 pp. Notre Dame, IN: University of Notre Dame Press, 2000.

Publication of this multi-authored volume on humanistic implications of the Human Genome Project (HGP) in the same year as the announcement of virtual completion of the project was especially timely. The anthology of essays contains a wealth of information and ideas valuable to professional scholars, teachers, and laypersons wishing to participate constructively in the dialogue on appropriate societal responses to the new powers with which our species is endowing itself.

Phillip Sloan is Director of the J. Reilly Center for Science, Technology and Values at Notre Dame, which along with the Department of Energy ELSI (Ethical, Legal, and Social Implications of the HGP) Program sponsored a 1995 conference at the University of Notre Dame for discussing humanistic implications of the HGP. This book is the published version of that conference. Sloan has provided an introductory article and edited 20 other contributions, 15 essays and five accompanying commentaries, by 23 authors that comprise the four parts of the book: (1) Origins of the Genome Project, (2) The Genome Project and Eugenics, (3) Is a Strong Genetic Reductionist Program Possible?, and (4) Reductionism, Determinism and Theological Humanism. Contributors include preeminent philosophers, theologians, scientists and historians of science from France, Great Britain, and the United States: John Beatty, Robert Bud, Arthur L. Caplan, Alice Domurat Dreger, Kevin Fitzgerald, Jean-Paul Gaudilliere, Jean Gayon, Marguerite Hays, Lily E. Kay, Evelyn Fox Keller, Philip Kitcher, Timothy Lenoir, Edward Manier, Richard A. McCormick, Ernan McMullin, Timothy Murphy, John M. Opitz, Diane Paul, Arthur Peacocke, Martin S. Pernick, Hans-Jorg Rheinberger, Kenneth Schaffner, and John Staudenmaier.

My professional training is in cell biology, so this review does not stem from special expertise in any of the humanistic disciplines represented by the contributors. It is undertaken because of an interest in the interface between science and the humanities nurtured for several years by involvement in an interdisciplinary, undergraduate world history program that examines connections between the "two cultures." Since I know what a genome is and basically how genes and other cell parts work, I claim at least to be able to judge whether the

humanistic perspectives expressed in this book are rooted in an accurate understanding of the relevant science. At the most, I can give a biologist's evaluation of some of those perspectives and the clarity with which they are expressed. Although even a cursory review of every essay would be impractical, I will comment on several that I found insightful, provocative, or especially informative. I also include opinions about the balance of subject matter contained in the book and the collection's usefulness to scientists and teachers.

In June, 2000, Francis S. Collins and J. Craig Venter, leaders of the public and private sectors' genome sequencing efforts respectively, announced virtual completion of the project which originally was not expected to be finished until 2005. That the conference at which the papers in this book were presented occurred five years earlier in no way diminishes its relevance to the social issues that completion of the HGP thrusts before us now.

How humankind as heirs of the Scientific Revolution and the Enlightenment and/or the United States as a modern democracy came to commit itself to the HGP are subjects addressed by Sloan's introduction, "Completing the Tree of Descartes," and of essays in Part 1.

Sloan carries the reader from Descartes' dualistic view of humankind (transcendent mind separated from material body, with the latter understood as a hydraulic machine subject to the laws of a mechanistic physics) through 18th century vitalism and ultimately to the emergence of a new form of reductionism for 19th century life science. Sloan argues that although the 19th century developments bore no immediate historical connections with the Cartesian project, they retained striking conceptual resemblances to it. An experiment-based, chemical-physical explanation for body heat via the work of Lavoisier in the 1770s and 80s presaged the statement by Emil Dubois-Reymond, a biophysically oriented, late 19th century medical physiologist of the Berlin Physical Society, that "no other forces than the common physical-chemical ones are active within the organism."

Reducing the biological to the physical has continued to be a hallmark of the modern reductionist program in the life sciences. Twentieth-century manifestations of that program include the biochemical characterization of metabolic pathways, the discovery of double-stranded DNA structure, and the HGP itself. Sloan acknowledges the great potential of the HGP to provide a bounty of medical benefits for humankind. But he is unsettled by the presumption of many scientists and self-anointed explainers of science to the general public that the reductionist program in biology, molecular biology in particular, will ultimately be able to explain humankind's theological bent and provide a full explanation of self-reflective consciousness in purely physical terms.

Digesting the final 11-page section of Sloan's essay subtitled "Genomics and Reductionism" was difficult for a mere scientist but became possible after the third or fourth reading with the aid of the *Routledge Encyclopedia of Philosophy*. In this section Sloan argues for a return to Descartes' metaphorical tree of human endeavors in order to recall that Descartes placed (properly so, says Sloan) theological/human consciousness issues at the root of the tree. He viewed these as reflecting a priori preconditions for the mechanistic, reductive science that forms the trunk of the tree and from which emerge the various branches of knowledge: Medicine, Mechanics, and Ethics. Via tortuous paths, Sloan sides with Descartes in arguing that knowledge about theological issues and the reality of humankind's reflective nature are not subject to causal analysis via the scientific method. Although Sloan never says so directly and with clarity (at least for me), the title of his essay appears to refer to the

opportunity that modern molecular biology and strong reductionism in the other sciences have for adorning the tree's branches with fruits, elements of the metaphor that Descartes' early death at 54 prevented him from fully developing. None of these will be metaphysical fruits though, and none will show us the meaning of our existence or the values that we should embrace, according to Sloan. "Returning to Descartes' Tree" would have been a more apt title for this essay since most of Sloan's effort is an attempt to persuade us that "wisdom emerges not out of our physics and biophysics, but from our recognition of our science as a product of human consciousness reflecting upon itself." Although hardcore sociobiologists and strict materialist neurobiologists will find many points for disagreement in this essay, it does very nicely frame many of the philosophical, theological, historical, and ethical issues addressed in detail by other authors in subsequent essays.

Of the five essays in Part 1, the first and last were my favorites. In "The Manhattan Project for Biomedicine," Lenoir and Hays tell of the continuity between the government's atomic bomb project of the 1940s and today's public HGP. With interesting historical details and in clear prose, they explain how the U.S. government purposefully transferred resources and personnel after World War II from a nuclear bomb effort to a nuclear biomedical effort that included the development of radioisotopes for biology, radiopharmaceuticals, bioinstrumentation including scintillation counters, and establishment of the discipline of radiological safety. Along with this massive and successful government technology transfer came incentives for involvement of private industry and public universities in biomedical research. The Atomic Energy Commission and biomedical elements of its founding charge in 1946 drove this transfer of technology. Although the HGP of the 1980s was a natural outcome of the redirection of national attention toward biomedicine forty years earlier, a selling job still had to be done on the public and the scientific community before the HGP could be legislatively established as a national, scientific priority akin to the moon project of the 1960s. How this was accomplished is the subject of Dreger's wonderfully revealing and very readable "Metaphors of Morality in the Human Genome Project." What the essay reveals is how proponents of the HGP managed to make it patriotic to support the endeavor and unpatriotic to oppose it. Although many scientists advanced reasonable arguments that allocating billions of dollars to the HGP would cripple many other areas of basic and applied biological research, proponents of the program won the day by appealing to Americans' pioneer penchant for conquering frontiers and our heartily willingness to root out and destroy "bad things" - in this case, disease-causing genes. Reproductions of cartoons playing/preying upon these inclinations as well as one satirizing this approach (i.e. James D. Watson draped in the red, white and blue) add an effective touch to this essay.

All three essays in Part 2 on eugenics are excellent and accessible to readers from all disciplines. By reviewing the history of the eugenic movement in the U.S. in the first third of the twentieth century, Pernick's "Defining the Defective: Eugenics, Esthetics, and Mass Culture in Early Twentieth-Century America" sounds a warning for future eugenic programs that may make use of diagnostic and therapeutic techniques emerging from the HGP. He argues convincingly that decisions on what constitutes beauty or genetic defectiveness are largely value-based and controlled by the mass media, leaving the door open for racial, gender-based, and ethnic prejudices to drive eugenic decisions. "Do esthetic values create disability, in the same way that high stairs and other physical barriers do?", Pernick asks.

Caplan's "What's Morally Wrong with Eugenics?" categorizes eugenics in two ways:

negative vs. positive and individual vs. population. After discussing the outlook for selectively eliminating early embryos on the basis of their genetic constitution (negative eugenics), the purposeful alteration of the genetic information in germ cells (positive eugenics), and the terrible consequences of coercive, government sponsored eugenics (population eugenics), Caplan defends the right of individual couples to strive for the "perfect child" by whatever legal, non-coercive means technology offers (individual eugenics). Several arguments against this position are addressed by Caplan who maintains that overriding all of these is the "...right to reproduce without interference from third parties (as a) fundamental freedom recognized by international law and moral theories from a host of ethical traditions."

The final essay in this section by Philip Kitcher, "Utopian Eugenics and Social Inequality," is the most startling and the most morally challenging of the three. It is startling because the reader is made to realize that whether to practice eugenics is not optional because "...once we know how to identify...genotypes of future people, eugenics is the only option...once we lose our genetic innocence, we have alternatives, and, because we have to elect one of the alternatives, we have to practice eugenics." It challenges societal morals by asking "...why should we rush (to develop gene therapy procedures) to treat the unfortunate genetic inheritance of the few, while ignoring the unlucky social inheritance of the many? Shouldn't we commit ourselves to change the environments that break young lives as surely as defective proteins?" Kitcher maintains that there is no reason to believe that the medical benefits of the HGP will be any more justly distributed among those in need of them than are other resources now such as food, shelter, and education opportunities. Which should receive priority: research for genetic therapy for the few or a commitment to allocate our present resources to bringing nearly everyone's expected quality of life to a minimal level? For Kitcher, a utopian eugenics is premised upon freedom of reproductive choice for all and can only occur if all infants born with debilitating genetic conditions are offered the best support available and are assured that they can live their lives free of social prejudices.

Two essays and accompanying commentaries constitute Part 3 on the outlook for a strong genetic reductionism, the notion that we can understand organisms, including their physiological functions, heritable disease states, and behavior by studying their genes. These contributions disappointed me. The first by Keller, "Is There an Organism in This Text?", is a history of the metaphors used to describe the unit of heredity, beginning with the pangens (minute particles in germ cells) of Hugo DeVries (1889) and ending with the author's "multi-layered parallel computer network". Keller was educated as a physicist and now writes about the history of biology. This contribution complements that of Kay's history of molecular genetics in Part 1 and would more appropriately have been placed there.

The second by Schaffner, a philosopher and M.D., argues against the prospect for a strong genetic reductionism. To bolster his view, Schaffner points out that even in one of the simplest and most thoroughly studied multicelled organisms, the 959-celled roundworm *Caenorhabditis elegans* with an entire nervous system comprised of just 302 neurons, behavior is very difficult to characterize in terms of the activity of specific genes. One of eight reasons cited for this is the so-called *many-genes one-neuron* rule, meaning that the coordinated activity of many genes is required for the existence of a single neuron. The implication is that the complexity of gene expression that is required to build and sustain neural networks in even the most simplest organisms precludes an exhaustive genetic analysis of the behavior that emerges from those networks. Schaffner is right that many genes are required to produce a

single neuron; in fact, this is true for any type of cell, and the number of genes is more than "many", it is thousands. The majority of these genes are "house-keeping" genes whose activity is required for the life of any cell. The number of genes whose action make one cell type different from another cell type is relatively small by comparison. Furthermore, an electrician does not need to understand the behavior of every electron in every wire in order to accurately read a circuit diagram or even to modify the diagram so as to alter the function of a device. I am not as pessimistic as Schaffner about future prospects for relating genetics to neuroanatomy and behavior. Consider the exponential growth of our understanding of living systems and the technologies for their analysis over the past 30 years. Nobody predicting in 1970 that a HGP would be undertaken and completed before the turn of the millennium would have been taken seriously. And at the inception of the HGP in the mid-1980s, nobody foresaw the microarray technology that now allows patterns of gene expression to be analyzed in single cells or the formation of a new discipline called proteomics whereby the complex interactions of the protein products of gene expression will be made to give up their secrets. Balance of outlook in this section could have been obtained by contributions from a practicing molecular biologist and a sociobiologist.

The five essays in the final section of the volume take up theological questions emerging from the HGP - questions that in one way or another ask what it means to be human and what might be the limits of science in understanding human life in all of its dimensions. Although some are more direct about it than others and the approaches vary, each author in this section, I believe, is either attempting to leave room for God in humankind's odyssey or presuming Her presence in moral theologies. At the same time, there is no hint that any one of the authors doubts our origin through naturalistic, evolutionary processes or our aliveness due to nonvitalistic phenomena whose details will become increasingly revealed by information emerging from the HGP. FitzGerald's contribution on philosophical anthropologies I found wordy and obscure which may very well reflect my ability to read philosophy rather than the author's style of communication. McCormick's piece on moral theology contains a wonderful 1982 quotation from the U.S. House of Representatives which highlights the concern voiced earlier by Kitcher about national priorities and social justice:

"Most countries of the world can afford little or nothing for elaborate genetic research. In this country, what resources should go into genetic therapies that may some day cure cancer as compared with correcting environmental causes of cancer that are operational right now? What resources should be assigned to research into the unknown as compared with correction of nutritional deficiencies for which answers are available now?"

For persons with theological interests I recommend the essays by McCormick, Opitz, and McMullin. The latter addresses the concept of "emergentism" as it relates to the appearance of a metaphysical soul during the evolution of the physical properties of the brain

The greatest strength of this collection is that it contains excellent pieces for nearly everybody. Dreger's and Caplan's essays are beautifully written and ideal for undergraduate students. I know from classroom experience that the provocative information contained within them, and their focus on the science-media interface and the science-morality interface, respectively, stimulate vigorous and constructive discussion among freshman to senior level

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students who have read the articles. Graduate students and scientists in molecular biology will benefit by reading about the origins of their discipline in the essays of Lenoir and Hays, and of Kay. Pernick's piece should interest social scientists, clinical geneticists, and genetic counselors; moreover, the material in this essay is very appropriate for undergraduate students and even junior/senior level high school students. Using the entire volume for a graduate seminar course on 21st century biology and human values with professors from diverse disciplines present to lead the discussion would be great fun.

**Minutes**  
**AAS Spring Executive Committee Meeting**  
**Mandarin House Restaurant**  
**Opelika, Alabama**  
**March 28, 2001**

**Call to Order and Approval of Minutes (A)** President Richard Hudiburg called the meeting to order at 7:35pm. The minutes of the Fall meeting of the Executive Committee (Oct. 21, 2000) were approved.

**Officer Reports (B)**

1. Eugene Omasta (**Board of Trustees**) reported that Ken Marion and Larry Boots have both been elected to the AAS Board of Trustees.
2. Richard Hudiburg (**President**) discussed his activities over the past year, which included: (a) preparing the program for the annual joint banquet of AAS and AJAS; (b) consulting with Roland Dute, President-elect, on numerous occasions concerning committee chairs and committee members; (c) updating email addresses of AAS officers, committee chairs, committee members, and section chairs and vice-chairs; (d) updating web-page application materials for the Committee on Research in preparation for the 78<sup>th</sup> annual meeting; (e) having numerous communications with Leven Hazlegrove, Executive Director of AAS, concerning business of the Academy; (f) serving as a judge for the paper competition for the Northwest region of the AJAS; (g) developing a web-page for the AAS (<http://www2.una.edu/psychology/aas.htm>) (the page has information about the AAS, officers, committee chairs, committee members, section chairs, and section vice-presidents. The Constitution of AAS will be added soon, and the site will be linked as an affiliate of the AAAS); (h) consulting with several members of the local arrangements committee in preparation for the annual meeting; and (i) consulting with several former presidents of AAS concerning preparations for the 78<sup>th</sup> annual meeting.

Ellen Buckner moved that the Alabama Academy of Science register for a domain name (org) for the Alabama Academy of Science. This motion was seconded and passed.

3. Roland Dute, the **First Vice-President and President Elect** of the Academy, reported that he had: (a) helped fill several vacancies on appointed committees; (b) served as a liaison between the Executive Officer and the Local Ar-

## Minutes

rangements Committee; and (c) helped make preparations for the Gorgas competition, including the location of rooms and selection of judges.

4. Stephen Watts, **2<sup>nd</sup> Vice-President** of the Academy, reiterated the duties of his office, which include: (a) familiarization with the organization and workings of the Academy; and (b) serving as chair of the Nominating Committee. Dr. Watts stated that the apparent complexities of the Society can be mitigated by continued development of electronic databases and web pages, so as to allow quick access to the full human resource component of the Academy with links to the various committees and personnel. He reported that several individuals within various committees had reached their term limits and announced the following replacements and reassignments:
  - Virginia Villardi, a teacher at Wetumpka High School, has agreed to replace Mary Thomaskutty as coordinator of State Science Fairs. Dr. Watts introduced a resolution honoring Mary Thomaskutty for her work as coordinator of the science fairs, and this was passed.
  - Jane Nall has agreed to continue another term as coordinator of the Science Olympiad. Steve Carey has offered to serve as co-chair because of the increase in registered schools.
  - David Nelson, University of South Alabama, has been asked to consider the position of **2<sup>nd</sup> Vice-President** for 2001. Dr. Watts indicated that we should all encourage his involvement, as he has been a substantial contributor to the Academy for a number of years. Watts noted that additional nominations for the position are on hold pending Dr. Nelson's decision.
  - Eugene Omasta and Michael Moeller have agreed to continue as Trustees, and William Barrett has resigned. Dr. Watts said that the Academy should thank Dr. Barrett for his years of excellent service to the Academy. Adriene Ludwick has not responded to whether she will continue as a Trustee.
  - Dr. Watts also reported that he has agreed to serve as the representative to the American Association for the Advancement of Science (AAAS).
  - Finally, Dr. Watts indicated that he will be working with Roland Dute to insure a smooth transition among the current officers of the Academy.
5. The **Secretary** (Dail Mullins) had no formal report but indicated that he and his assistant, Ms. Kathryn Pitt, were slowly getting a "handle" on the new position.
6. Larry Krannich, the **Treasurer**, was not present, but turned in a lengthy report. The total account balances as of 12/31/00 were \$74,049.41. Although the AAS had budgeted a deficit of \$8,665, the year ended with an actual deficit of

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\$11,280.96, due mainly to the lack of receipt in calendar year 2000 of revenue from the 2000 annual meeting at Samford University, and to loss in dues revenue of \$5,065. This latter problem was due to the fact that dues notices were not sent until the close of the fourth quarter. Thus, dues income noted for the first quarter of 2001 probably reflects what should have been collected in the fourth quarter of 2000; taking this into consideration, we would have met dues budget projections in 2000. Interest, Journal, and Science Olympiad incomes were greater than projected, and both meeting and Gorgas expenses were under budget.

For 2001, the Academy is operating with a budget that mirrors the 2000 budget. Please note that the income from the 2000 Annual Meeting at Samford University has now been received. Journal support is above budget. Although dues income is high, this is an artifact of when dues notices were mailed. Expenditures are tracking what is expected for the first quarter of a fiscal year. In short, the Academy does not expect any unforeseen budgetary problems during 2001.

The Treasurer's Report included copies of the following documents:

- **All Account Balances** as of 12/31/00
- **Activities** relative to the **2000 Budget** for the period 1/1/00 through 12/31/00.
- **Treasurer's Summary Report by Quarter** for the period 1/1/00 through 12/31/00.
- **Treasurer's Summary Report by Account** for the period 1/1/00 through 12/31/00.
- **All Account Balances** as of 3/15/01.
- **Treasurer's Summary Report by Quarter** as of 3/15/00 for the period 1/1/00 through 3/15/00
- **Activities Relative to the 2001 Budget** for the period 1/1/01 through 3/15/01.

It was moved (and seconded) to accept the budget, and this passed unanimously.

7. Jim Bradley, the **Editor of the JAAS**, reported that the Journal seems to be thriving with increased numbers of submissions and continued support from the Auburn University Library—at least through the current fiscal year ending September 30, 2000. During the year 2000, three issues of the *Journal* were published. A combined January/April issue contained 133 abstracts from the annual meeting compared to 127 in the January/April, 1999, issue. Ten re-

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search articles were published in 2000, four of these being Symposium articles from the Problem-Based Learning Symposium. By comparison, eight research articles were published in 1999, five of these being from the Karst Symposium. No book reviews were published in 2000, whereas three book reviews were published in the 1999 volume.

Bradley reported that publication of the journal is nearly back on schedule, and that the January, 2001 issue was about to go to press. Three more issues for 2001 are anticipated.

The Editor requested that fees paid to the typist, Sue Bradley, be increased from \$4.00 to \$5.00 per page (which was agreed upon by the Executive Committee), and that the abstract submission fee to the journal be waived for students. His recommendation was that the Academy continue to publish a hard-copy journal with four issues per year, pointing out that a \$5.00 increase in membership dues would more than offset the anticipated (proration) loss of support from the AU Library. This latter suggestion was tabled until the Fall Executive Committee meeting.

8. B. J. Bateman, **Counselor to the Alabama Junior Academy of Science**, was not present, but submitted a written report. The AJAS has a full schedule of activities planned for the annual meeting, including: the paper competition among 40 regional winners; local tours; the caucus and election of state officers; presentation of awards; and the joint banquet. At this time, Bateman reported, about 60 students and sponsors have pre-registered for the meeting and about 60 plan to attend the joint banquet.
9. It was reported that Virginia Valardi, the new **Science Fair Coordinator**, will be accompanying 19 Alabama winners to the International Science and Engineering Fair in San Jose, CA.
10. Jane Nall, the **Science Olympiad Coordinator**, was not present, but turned in an extensive written report. Members were reminded that the activities of the Science Olympiad are available on the organization's website at <http://aso.jsu.edu>.

**Elementary Science Olympiad Tournaments** include two teams at Geneva High School (December 2<sup>nd</sup>); fifteen teams at Jacksonville High School (February 4<sup>th</sup>); and thirty-seven teams at Auburn University (April 28<sup>th</sup>).

### **Secondary Regional Tournaments:**

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- **University of Alabama**, Tuscaloosa; February 17<sup>th</sup>; Dr. Kevin Whitaker, College of Engineering ([kwhitaker@coe.eng.ua.edu](mailto:kwhitaker@coe.eng.ua.edu)) and Cay Hamner, College of Engineering ([chamner@coe.eng.ua.edu](mailto:chamner@coe.eng.ua.edu)); Divisions B and C.
- **Auburn University**, Auburn; February 24<sup>th</sup>; Dr. Steve Stuckwisch, Department of Geology (334.844.6575); Divisions B and C.
- **University of Alabama at Huntsville**, Huntsville; March 3<sup>rd</sup>; Mrs. Vanessa Colebaugh (256.922.5747); Divisions B and C.
- **University of South Alabama**, Mobile; March 3<sup>rd</sup>; Dr. Steve Itaya, Department of Biomedical Science (334.380.2710); Divisions B and C.
- **Jacksonville State University**, Jacksonville; March 3<sup>rd</sup>; Dr. James Rayburn, Department of Biology (256.782.5781)

### Secondary State Tournaments:

- **Huntingdon College**, Montgomery; April 7<sup>th</sup>; Dr. Sidney Stubbs (334.833.4430); Division B.
- **Troy State University**, Troy; April 7<sup>th</sup>; Dr. Udo Schnupf (334.670.3577); Division C

The National Science Olympiad will be held at Colorado Springs, Colorado, in May, 2001. There will be two B and two C Division teams from Alabama.

11. **Counselor to the AAAS**—see B4 (above)

12. **Section Officers**—written reports were turned in for sections I and V only.

- **Section I** (Biological Sciences)—Frank Romano. The 2001 meeting at Auburn University has 26 oral presentations and 10 posters scheduled for the Biology Section. The oral presentations were grouped into three sessions: Thursday am, Thursday pm, and Friday pm. Friday am accommodates the Bioethics Symposium. Dr. Romano's tenure as chair of the Biology Section concludes as of March 30, 2001; he will be succeeded by Dr. Donald Salter at the University of West Alabama. Nominations for a new vice-chair will be accepted and voted on during the business meeting scheduled for March 29<sup>th</sup>.
- **Section V** (Physics and Mathematics)—Govind Menon. In the 2001 annual meeting, Section V hosted a total of 14 presentations, 12 oral and 2 posters. The Section chair intends to send out letters to all universities/colleges in the state which offer degrees in Physics/Mathematics and encourage participation of not just faculty, but also graduate and undergraduate students engaged in research. In doing so, it is hoped that a list of

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all programs in the state (along with relevant contact information) can be developed for use by future chairs; such a list should cut down the work involved in future recruitment efforts.

13. **Executive Director** Lev Hazelgrove was present and presented his written report. Since the Fall Executive Meeting on October 21<sup>st</sup>, 2000, at Southern Research Institute, the Executive Director has been working on the following projects:

- Set up and prepared (with the leadership of Dr. Ellen Buckner, co-chair, and Dr. Roland Dute, local chair) the Gorgas Scholarship Program for Science Talent Search in cooperation with the Westinghouse (now Intel) Scholarship Science Service, Inc., Washington, DC, for the annual meeting at Auburn University on March 28-31, 2001.
- Prepared for bulk mail 700 "Call for Paper Titles" for Auburn Meeting, March 28-31, 2001, edited by Dr. William J. Barrett (out November, 2000).
- Ordered from EBSCO the Gardner plaque for Dr. James B. McClintock, Professor and Dean, UAB, with the selection by Dr. George Cline, Chair, Wright A. Gardiner Award.
- Prepared the three Carmichael Awards with the recommendation of Dr. William J. Boardman, Chair, Emmet B. Carmichael Award Committee, with check to each by the Treasurer, Dr. Larry Krannich.
- August 18, 2000, site visit with Dr. James Barbaree, Professor of Biology and his local committee for the AAS meeting, March 28-31, 2001. Accompanied by Drs. Dute, Omasta, Hudiburg, Bateman and Buckner.
- Prepared 12 abstracts for the Auburn meeting, for 11 section chairs and advised return by March 23, 2001, to Dr. Bradley.
- Studied flora, fauna and pollution, February 14-16, 2001, with Drs. Ken Marion and Robert Angus, and the Alabama Fisheries Association at Lake Eufala State Park.
- Worked to get the Alabama State Legislature to grant AAS exemption from state sales tax.
- Set up ASTA booth, Davidson High School, Mobile, AL, October 4-6, 2001, with Drs. Nelson, Barrett and Tompkins.
- Met with the Gorgas Scholarship Committee at the Alabama Power Foundation, to discuss a \$1000 award to the winner that goes out-of-state.

## Committee Reports (C)

1. **Local Arrangements Committee** (James Barbaree)—written report. The committee consisted of: Jim Bradley, University Liaison Officer; Mike Miller,

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AAS Program Coordinator; Angela Morrow, AJAS Program Coordinator; Roland Dute, Gorgas Program Coordinator and Publicity Director; Barbara Estridge, Registration and Audiovisual Services Coordinator, and; Marione Nance, Poster Coordinator.

- **Registration**—attendees can register in the lobby of Funchess Hall, 7:30am-4:00pm on Thursday, and 7:30am-2:00pm on Friday.
  - **Session Locations**—the meeting will take place in three buildings: Life Sciences Building (AAS), Funchess Hall (AAS), and Parker Hall (AJAS).
  - **Audio-Visual Equipment**—Barbara Estridge should have all the appropriate projection equipment for the presentations. Slide previews can be made in room 102 Life Sciences Building (LSB), and room 308 Funchess Hall throughout the meeting.
  - **Social Hour**—we have a social hour, 6:00pm-9:00pm, in the Rotunda of the LSB. This same area will be used for posters.
  - **Symposium**—the Bioethics Symposium will take place 8:30am-NOON, Friday, in LSB 112
  - **Group Picture**—the group picture will be taken on Friday, at NOON, on the steps of the front entrance of the LSB.
  - **Business Meeting**—the annual business meeting will be held at 6:00pm, Friday, in LSB 112.
  - **Banquet**—a delicious buffet banquet meal is planned for Friday evening. We have two internationally known speakers for the event. Also, Drs. John Pritchett and Michael Moriarty will represent the Auburn University administration.
  - **AJAS**—Auburn science tours will be available at 1:30pm on Friday for AJAS attendees. Also, a Sci-Fi Social will take place at 10:30pm, in the LSB.
  - **Summary**—Everything is in place for a productive and enjoyable meeting. A final tally for the number of registrants and monies taken-in and expended will be available after the meeting.
2. **Finance** (Eugene Omasta)—written report. Although the account balances ended the year with an \$11,280.96 deficit, the AAS continues to be in excellent financial condition with total assets of \$83,647.59 (as of 3/15/01). Moreover, since the Academy has received the Annual Meeting revenue of \$4,023.89 from Samford University and member dues payments have increased by \$1,810 through 3/15/01, the deficit has been reduced to \$5,447.07. One would expect this total to be further reduced by dues collected during the remainder of march, which includes the annual meeting. As Dr. Krannich explained in his report, the shift of some of the dues revenues from the last quarter of 2000

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to the first quarter of 2001 is explained by the late mailout of statements in the year 2000. However, two problems are suggested:

- Even if an increase of member dues payments during the first quarter of 2001 meets the shortfall of \$5,065 in the 2000 budget, there would still be a \$2,192.07 deficit. The most glaring item is the \$2,909.81 deficit for Journal expenses in the 2000 budget.
- If member dues payment increases in the first quarter of 2001 are significantly below the shortfall of \$5,065, this suggests a decrease in membership.

3. **Membership** (Anne Cusic)—written report. During the past year I communicated with each member of the membership committee (the Vice-Chairs of each Section) to inform them of the number of paid members in his/her respective sections. I requested that each of them develop strategies to increase members in their sections. I also solicited ideas of ways to increase membership. This request was not very successful. Paid membership in the Academy has fallen from 396 in March, 2000, to 356 in March, 2001. The Section breakdown is as follows (the first number is for March 2000; the second for March, 2001):

- Biological Sciences (136, 106)
- Chemistry (43, 48)
- Earth Sciences (17, 13)
- Geography, Forestry, Conservation and Planning (17, 18)
- Physics and Mathematics (45, 43)
- Industry and Economics (13, 11)
- Science Education (14, 14)
- Social and Behavioral Science (17, 22)
- Health Sciences (52, 52)
- Engineering and Computer Science (24, 25)
- Anthropology (7, 4)
- Section Not Listed (3, 0)

For the next year, each member of the Academy should attempt to recruit at least one new member in his/her section. I again request that we allow members to pay dues for more than one year.

4. **Research** (John Eley, Larry Boots)—written report. The Chair of the Research Committee for 2000-2001 received no requests for application material directly and assumed that the web site was fully operational in this respect. There were two applications for Student Research Grants—both are recommended for full funding. These projects are:

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- “Use of Oak Hammocks by Neotropical Migrant Songbirds during Stopover in Coastal South Carolina” (Scott Somershoe, Auburn University, Biological Sciences)
- “Runnable Natural Language Specifications Using Two Level Grammar” (Lee Deum-Seuk, University of Alabama at Birmingham, Engineering and Computer Science)

There were 11 students who applied for Travel Grants—all were funded at the full amount (\$50):

- Lee Beum-Seuk (UAB)
- Xidong Zheng (UAB)
- Samina Paniolal (UAB)
- Xiaqing Wu (UAB)
- Fei Cao (UAB)
- Ifeoma Opara-Bierria (UAB)
- Brandy Lambert (UNA)
- Amy Campbell (UNA)
- Dena McGuy (UAB)
- Yashui Lu (UAB)
- Jung-me Park (UAB)

Fifteen students are potentially presenting posters in the Student Research Awards Competition. These consist of eight in Health Sciences, three in Science, and four in Engineering. Two students are potentially presenting papers in Engineering.

It is suggested that on each of the different application forms on the web site, there be added an additional portion to complete regarding the student's eligibility (i.e., AAS membership status, meeting registration).

5. **Long-Range Planning** (Ken Marion)—written report. The committee considers a number of items important to the long-term well-being of AAS, or at least worthy of discussion and consideration in the near future. Some of these items were generated at the Executive Committee dinner prior to the fall meeting:
  - Recommend continuation of the Executive Committee dinner before the Fall meeting.
  - Central location for annual meetings—the Committee feels that the Place of Meeting Committee should continue in the future to seek sites centrally located on a fairly regular rotational basis in order to maximize participation.

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- Explore joint meetings—there may be some groups within the state that would be appropriate to consider for future joint meetings (e.g., the Alabama Microscopical Society) Such meetings might serve to boost a “critical mass” for both organizations.
  - Expand membership categories—to our knowledge, we currently do not have a multi-year membership option (i.e., 2-3 years). Such a category would cut down on mailing expenses and provide a more stable source of revenue.
  - Maintenance of web site—the web site should be regularly maintained and updated.
  - Regularity of newsletter—a regular, on-line edition may be appropriate.
  - Program Printing Software—the Executive Director has suggested the purchase of appropriate software to prepare the program for the Annual Meeting. This also has a potential for saving money.
  - Journal—the Committee recommends that we continue to monitor the Journal in light of expenses and continue to assess the pros- and cons- of on-line publication.
6. **Auditing-Senior Academy** (Denny Bearce)—no report
  7. **Auditing-Junior Academy** (Danice Costes)—written report. Net worth as of 6/30/00 is \$21,197.35.
  8. **Editorial Board and Associate Journal Editors** (Thane Wibbels, Larry Witt, William Osterhoff)—written report. The Committee is pleased to announce that the following institutions have supported the *JAAS* as benefactors (please note that Auburn University should also be listed as a benefactor because of its significant annual contribution to our publishing costs):
    - \$500—Samford University, UAB, UA, USA, University of West Alabama
    - \$400—AUM
    - \$250—Jacksonville State University, University of Montevallo, Troy State University
    - \$100—UNA, Birmingham Southern College
  9. **Place and Date of Meeting** (Thomas Bilbo)—written report. Unchanged from the fall Executive Committee minutes.
  10. **Newsletter** (vacant position)—no report. It was mentioned that the Associate Editor for Electronic Media position is also vacant. Richard Hudiburg volunteered his services for this task.

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11. **Public Relations** (Myra Smith)—no report.
12. **Archives** (Tony Best)—no report.
13. **Science and Public Policy** (Dail Mullins)—no report.
14. **Gardner Award** (George Cline)—no report.
15. **Carmichael Award** (William J. Boardman)—written report. Boardman reported that Velma Richards would be taking over as Chair. The Committee selected the paper "Effects of Exogenous Juvenile Hormone on Vitellogenesis in the Cricket, *Acheta domesticus* (L.)", by James T. Bradley, H. Shin Shim, and Kelly Moody to receive the Emmett B. Carmichael Award at the Annual Meeting in 2001.
16. **Resolutions** (Priscilla Holland)—written and oral report. Be it resolved by the Executive Committee that the following script be employed at the appropriate time:

### PRESENTATIONS AT THE ANNUAL BANQUET

Each year the Academy recognizes individuals who have served it in an exceptional manner.

1. First and foremost we recognize: William F. Walker, Interim President of Auburn University, for graciously hosting the 78<sup>th</sup> Annual Meeting of the Alabama Academy of Science
2. The Academy would also like to recognize: James M. Barbaree, Chair, Local Arrangements Committee, for the many weeks of planning and hard work that enabled us to have this very successful meeting
3. The Academy would like to recognize the behind-the-scenes contribution Dr. Roland Dute has made to assure that the 78<sup>th</sup> Annual Meeting of the Alabama Academy of Science convene
4. Lastly, the Academy thanks Richard Hudiburg for his able leadership of the Academy as its president during the past year.

The Academy would like to take a moment to recognize the following members of the Academy whom it has lost through death over the past year:

George T. Crocker, Eugene Sledge

17. **Nominating Committee** (Stephen Watts)—no report.
18. **Mason Scholarship** (Michael Moeller)—written report. Seven completed applications for the William H. Mason Fellowship were received; the committee

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selected Jeannine Ott to receive the \$1000 fellowship. Ms. Ott received a B.S. with a major in Wildlife Science from the University of Georgia and a M.S. in Biological Sciences from Auburn University. She presently is in the fifth-year program in the Department of Curriculum & Teaching at Auburn University.

19. **Gorgas Scholarship Program** (Ellen Buckner)—written and oral report. The Committee is pleased to report that the Alabama Science Talent Search continues to grow with 30 submissions from the state to the Intel National Science Talent Search. Three of the entries were named National Semifinalists. The finals of the Gorgas Competition will be held Friday, March 30, 2001, in the Rouse Life Sciences Building. Finalists were named from seven high schools from across the state. The Committee would like to recognize the outstanding teacher-sponsors of these finalists. Their work in encouraging students to enter the competition is instrumental to both the success of the program and to the success of the students: Wanda Griffis (Murphy High School); Trudy Anderson (JCIB); Jennifer Roundtree (Bob Jones High School); Vicki Farina (Brooks High School); Melonie Hanson (J. O. Johnson High School); Jim Walley (Arab High School); and Patricia Davis (Arthur Harold Parker High School).

I am also pleased to report that Tuskegee University has joined the list of those offering additional scholarships to Gorgas winners and finalists. This brings to sixteen the number of colleges and universities offering additional scholarships.

Finally, I would like to thank Dr. Roland Dute for his excellent assistance in recruitment of additional judges from Auburn for this year's competition.

**Old Business (D)**—none

**New Business (E)**—Ellen Buckner reported that she has been appointed to the state Career Technical Course of Study Committee, which will discuss whether there should be a core course.

The meeting was adjourned at 10:00pm.

Respectfully submitted,

Dail W. Mullins, Jr.  
Secretary, Alabama Academy of Science

## Notes

## INSTRUCTIONS TO AUTHORS

*Editorial Policy:* Publication of the *Journal of the Alabama Academy of Science* is restricted to members. Membership application forms can be obtained from Dr. A. Priscilla Holland, Office of Research, UNA Box 5121, University of North Alabama, Florence, AL 35632-0001. Subject matter should address original research in one of the discipline sections of the Academy: Biological Sciences; Chemistry; Geology; Forestry, Geography, Conservation, and Planning; Physics and Mathematics; Industry and Economics, Science Education; Social Sciences; Health Sciences; Engineering and Computer Science; and Anthropology. Timely review articles of exceptional quality and general readership interest will also be considered. Invited articles dealing with Science Activities in Alabama are occasionally published. Book reviews of Alabama authors are also solicited. Submission of an article for publication in the implies that it has not been published previously and that it not currently being considered for publication elsewhere. Each manuscript will receive at least two simultaneous peer reviews.

*Submission:* Submit an original and two copies to the editor. Papers which are unreasonably long and verbose, such as uncut theses, will be returned. The title page should contain the author's name, affiliation, and address, including zip code. The editor may request that manuscripts be submitted on a diskette upon their revision or acceptance.

*Manuscripts:* Consult recent issues of the *Journal* for format. Double-space manuscripts throughout, allowing 1-inch margins. Number all pages. An abstract not exceeding 200 words will be published if the author so desires. Use heading and subdivisions where necessary for clarity. Common headings are: **Introduction** (including literature review), **Procedures** (or **Materials and Methods**), **Results**, **Discussion**, and **Literature Cited**. Other formats may be more appropriate for certain subject matter areas. Headings should be in all caps and centered on the typed page; sub-headings should be italicized (underlined) and placed at the margin. Avoid excessive use of footnotes. No not use the number 1 for footnotes; begin with 2. Skip additional footnote numbers if one or more authors must have their present address footnoted.

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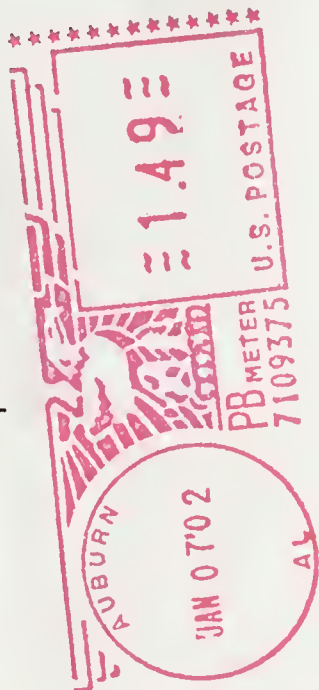
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